COMPAQ

ProLiant 5500

Setup and Installation Guide
For Intel Pentium II Xeon Processor-based Servers

First Edition (July 1998)
Part Number 328470-001
Compaq Computer Corporation

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About This Guide

This guide is designed to be used as step-by-step instructions for installation, and as a reference for operation, troubleshooting, and future upgrades.

IMPORTANT: These instructions are for use with Intel Pentium II Xeon processor-based servers only.

The power supplies in this computer system produce hazardous energy levels. The guide is for the person who installs, administers, and repairs servers. Compaq assumes you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels.

WARNING: There is a risk of personal injury from hazardous energy levels. The installation of options and routine maintenance and service of this product shall be performed by individuals who are knowledgeable about the procedures, precautions, and hazards associated with equipment containing hazardous energy circuits.

Using the Compaq Systems Reference Library CD

The Compaq Systems Reference Library CD (SRL) provides a wide variety of user, reference, and integration information. The SRL contains additional details on Compaq technology and provides information such as modem documentation, maintenance instructions, technotes, and part numbers for ordering options or spares. You can use the full-text search to find the information you need quickly.

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Server Documentation CD

The complete server documentation set is provided on the Server Documentation CD included with this book. For more information about these documents, see "What the Server Documentation CD Contains" later in this chapter. The following documents are included in the set:

- *Compaq ProLiant 5500 Setup and Installation Guide*
- *Compaq Servers Troubleshooting Guide*
- *Integrated Remote Console Guide*

Installing the Server Documentation CD

Follow these steps to install the electronic documentation. Close all other applications before installing.

Your documentation CD can be installed on any system meeting these minimum requirements:

- 486 processor or faster
- Microsoft Windows 3.1, Windows 95, or Windows NT 3.5 or higher
- 8 MB RAM or greater (16 MB recommended)
- VGA monitor, 640 x 480 resolution or higher
- 8 MB of hard disk space free for Adobe Acrobat Reader. The installation program installs the reader, if it is not already on your machine.

Windows NT

1. Insert the CD into the CD-ROM drive.
2. From the Windows Program Manager, select File and then Run.
3. Type <*drive*>:\SETUP and select OK; where <*drive*> is the letter of your CD-ROM drive.
4. The server documentation installation program starts. Select your server and the document you want to view. See "Accessing the Documents" later in this chapter.

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The "Compaq Server Documentation" program group and "Compaq ProLiant 5500 Documentation" icon will be created in your system. You must leave the CD in the CD-ROM drive to access the documentation.

Windows 95

1. Insert the CD into the CD-ROM drive.
2. Select Start and then Run.
3. Type <*drive*>:\SETUP and select OK: where <*drive*> is the letter of your CD-ROM drive.
4. The server documentation installation program starts. Select your server and the document you want to view. See "Accessing the Documents" later in this chapter.

The "Compaq Server Documentation" program group and "Compaq ProLiant 5500 Documentation" icon will be created in your system. You must leave the CD in the CD-ROM drive to access the documentation.

Windows 3.1

1. Insert the CD into the CD-ROM drive.
2. From the Windows Program Manager, select File and then Run.
3. Type <*drive*>:\SETUP and select OK: where <*drive*> is the letter of your CD-ROM drive.
4. The server documentation program starts. Select your server and the document you want to view. See "Accessing the Documents" later in this chapter.

The "Compaq Server Documentation" program group and "Compaq ProLiant 5500 Documentation" icon will be created in your system. You must leave the CD in the CD-ROM drive to access the documentation.

IMPORTANT: These installation instructions are for the ProLiant 5500, Intel Pentium II Xeon processor-based server documentation only.

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Accessing the Documents

From the main menu, click the "ProLiant 5500" button. Select the topic you want to view.

What the Server Documentation CD Contains

Topics	Document	Click On
Instructions for installation and reference for operation and future	*Compaq ProLiant 5500 Setup and Installation Guide*	Setup and Install
Instructions for installing and using the Integrated Remote Console.	*Integrated Remote Console Guide*	Integrated Remote Console
Steps for diagnosing and resolving common server	*Compaq Servers Troubleshooting Guide*	Troubleshooting

Finding Information

Once you open a document, you can search for information one of several ways:

- Search Engine
- Linked Table of Contents
- Links within text

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Using the Search Engine

Once you open a document, you can search for information you need:

1. From the Acrobat Reader menu bar, select Tools.
2. Select Find.
3. Enter the text you want, and select FIND.
4. To locate another occurrence of the same text, select Tools and then Find Again.

Using the Linked Table of Contents

Once you open a document, you can link to a topic from the table of contents. Click on the topic you want.

If a contents does not appear, select View, and then select Bookmarks and Page.

Using Text Links

Certain text is linked to other topics in the book. Linked text displays in blue. Click on the blue text to view the topic listed.

Printing the Documentation

Once you open a document, you can print the entire document or a single page:

1. From the Acrobat Reader menu bar, select File.
2. Select Print.
3. Use Print Range to select what you want to print.
4. Select OK.

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Getting Help

To access help:

1. From the Acrobat Reader menu bar, select Help.
2. Select the Reader Online Guide.

Starting the Documentation after Installation

To start the server documentation any time after the installation, complete these steps:

1. Insert the CD into the CD-ROM drive.
2. Open the Compaq Server Documentation group.
3. Click on the Compaq ProLiant 5500 Documentation icon.

Ordering Printed Documentation or Additional CDs

A set of printed documents on the CD is available. The set contains:

- *Compaq ProLiant 5500 Setup and Installation Guide*
- *Compaq Integrated Remote Console Guide*
- *Compaq Servers Troubleshooting Guide*

You may also order additional copies of the Server Documentation CD.

NOTE: The printed documentation and server documentation CDs are available in English only.

Ordering Electronically

To order documentation via the Compaq website, access www.compaq.com. Find your server, then under Manuals, select "Order Form for printed documentation and documentation CD for ProLiant 5500, Intel Pentium II Xeon processor-based servers only."

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Ordering by Fax

To order documentation by fax, use the Fax Order Form enclosed in the Reference Information box.

Text Conventions

This document uses the following conventions to distinguish elements of text:

Keys	Keys appear in boldface. A plus sign (+) between two keys indicates that they should be pressed simultaneously.
USER INPUT	User input appears in a different typeface and in uppercase.
FILENAMES	File names appear in uppercase italics.
Menu Options, Command Names, Dialog Box Names	These appear in initial capital letters.
COMMANDS, DIRECTORY NAMES, and DRIVE NAMES	These always appear in uppercase.
Type	When you are instructed *to type* information, type the information **without** pressing the **Enter** key.
Enter	When you are instructed *to enter* information, type the information and then press the **Enter** key.

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Symbols in Text

These symbols may be found in the text of this guide. They have the following meanings.

WARNING: Indicates that failure to follow directions in the warning could result in bodily harm or loss of life.

CAUTION: Indicates that failure to follow directions could result in damage to equipment or loss of information.

IMPORTANT: Presents clarifying information or specific instructions.

NOTE: Presents commentary, sidelights, or interesting points of information.

Symbols on Equipment

These icons may be located on equipment in areas where hazardous conditions may exist.

Any surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts.
WARNING: To reduce risk of injury from electrical shock hazards, do not open this enclosure.

Any RJ-45 receptacle marked with these symbols indicates a Network Interface Connection.
WARNING: To reduce risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

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Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.
WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching.

WARNING: Power Supplies or Systems marked with these symbols indicate the equipment is supplied by multiple sources of power.

WARNING: To reduce the risk of injury from electrical shock, remove all power cords to completely disconnect power from the system.

Rack Stability

WARNING: To reduce the risk of personal injury or damage to the equipment, a minimum of two people **MUST** lift the server into the rack. The rack-mountable server weighs in excess of 92 lb (41.8 kg.). If the unit is to be loaded above chest level, a third person must assist in aligning the rails while the other two support the unit.

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WARNING: To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling jacks are extended to the floor.
- The full weight of the rack rests on the leveling jacks.
- The stabilizing feet are attached to the rack if it is a single rack installations.
- The racks are coupled together in multiple rack installations.

A rack may become unstable if more than one component is extended for any reason. Extend only one component at a time.

This guide is designed to be used as step-by-step instructions for installation, and as a reference for operation, troubleshooting, and future upgrades.

Getting Help

If you have a problem and have exhausted the information in this guide, you can get further information and other help in the following locations.

Compaq Website

The Compaq Web Site has information on this product as well as the latest drivers and Flash ROM images. You can access the Compaq Website by logging on to the Internet at http://www.compaq.com.

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Telephone Numbers

For the name of your nearest Compaq Authorized Reseller:

In the United States, call 1-800-345-1518
In Canada, call 1-800-263-5868

For Compaq technical support:
In the United States and Canada, call 1-800-386-2172
For Compaq technical support phone numbers outside the United States and Canada, visit the Compaq Web Site at:

//www.compaq.com.

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Chapter 1
Introduction

Compaq ProLiant 5500

IMPORTANT: This manual is for Intel Pentium II Xeon processor-based servers only.

The Compaq ProLiant 5500 server delivers breakthrough performance and value in a space efficient form factor. Performance is maximized with up to four Intel Pentium II Xeon Processors, dual peer PCI buses, and up to four gigabytes of buffered EDO ECC memory. Input/output performance is enhanced by features such as Wide-Ultra SCSI-3 hard drives.

Compaq ProLiant 5500 servers provide state-of-the-art reliability and high availability features including support for redundant hot-pluggable power supplies, redundant fans, redundant NICs, and hot pluggable Wide-Ultra SCSI-3 drives.

Standard Features

The following features are standard on all Compaq ProLiant 5500, Intel Pentium II Xeon processor-based servers, unless otherwise noted.

Processor

Compaq ProLiant 5500 servers support up to four Intel Pentium II Xeon processors with corresponding processor power modules and support for future Intel Pentium II Xeon processors.

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System Memory

- ECC (Error Checking and Correcting Memory) with single-bit error corrections and detection down to a single DIMM, and multi-bit error detection down to the memory bank
- Supports EDO buffered, 60-ns or faster refreshed DIMMs
- Expandable to 4 GB (16 X 256 MB DIMMs)
- Supports up to 4 memory banks; each bank consists of 4 DIMMs. One bank is installed or removed at a time. Each bank must have four DIMMs of the same size and speed.

Expansion Slots

Seven I/O expansion slots:

- Six 32-bit PCI slots (one is populated with a Compaq Netelligent 10/100 TX PCI UTP Controller)
- One shared PCI/ISA slot

Media Bays

The Compaq ProLiant 5500 server can house up to 11 mass storage devices.

- Internal Hot-Plug Drive Bay
  - The ProLiant 5500 internal hot-plug drive cage can be configured with seven 1-inch drives or six 1.6-inch drives.

    For further information about media bay configuration, see Chapter 7, "Cabling."

NOTE: Optional Duplex Drive Cage Kit may be purchased separately.

- Internal Removable Media Bay Area

The four ProLiant 5500 internal removable media bays support the following:

- One bay occupied by a 1.44-MB diskette drive
- One bay occupied by a 24 X IDE CD-ROM drive
- Two half-height 5.25-inch drive bays

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SCSI

- Dual Channel Integrated Wide-Ultra SCSI-3 controller
- The following optional controller boards are currently supported (see www.compaq.com for updates on device support)
  - Smart Array 3200 Controller
  - SMART-2DH Array Controller
  - Wide-Ultra SCSI-3 Controller

Video

- Integrated PCI Video Controller provides maximum resolution of 1280 x 1024, 256 color, non-interlaced resolution
- 2-MB video SGRAM standard
- Supports SVGA, VGA, and EGA graphics resolution

Supported Interfaces

- Wide-Ultra SCSI-3 VHDCI (Very High Density Cable Interconnect) connector
- Serial (two connectors)
- Video
- Parallel
- Keyboard
- Mouse
- Dual-port 10/100TX UTP Ethernet (two RJ-45 connectors)

ROM

- Software upgradable firmware including diagnostics
- ROMPaq Utility used to upgrade ROM

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Fans

- Standard: Two 120-mm fans
- Optional: Two 120-mm redundant fans

Power Supply

- Standard: One hot-plug power supply that runs at 750W(220V)/ 500W(110V)
- Optional: One hot-plug redundant supply (RPS) that runs at 750W(220V)/500W(110V)

High-Availability Features

- Hot-Plug SCSI drives
- Optional redundant Hot-Plug Power supply
- Optional redundant NIC
- Optional redundant fans

System Management

- The Server Parameter Tracking utility provides timely server environment and subsystem information by using a combination of hardware, firmware, and industry standard management software. Information provided by this utility includes fault, performance, and configuration status.
- The Server Fault Tolerance feature provides many disk subsystem and memory system error correction fault tolerance options.
- The Rapid Recovery Services provides fast identification and resolution of complex faults. Highlights of this integrated server management feature include: Integrated Management Logs, Automatic Server Recovery-2 (ASR-2), and Compaq Integrated Remote Console.
- Integrated Management Display (IMD) offers a text-based user interface. This feature is standard on rack models and optional on tower models. The IMD (an LCD panel) displays and stores key system events at the server so that critical information is at your fingertips.

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- Integrated Management Log (IML) provides a detailed log of key system events. This log is accessible through Insight Manager, the Remote Insight board, the Compaq Survey utility, the Compaq IML Management utility, and the IMD.

Management and Configuration Tools

Compaq offers an extensive set of features and optional tools to support effective server management and configuration. These features are described in this guide:

- SmartStart and Support Software CD
- Fault Tolerance
- Compaq Insight Manager
- Automatic Server Recovery-2 (ASR-2)
- Integrated Management Display (IMD) standard on rack models
- Integrated Management Log
- Integrated Remote Console (IRC)

SmartStart and Support Software

The SmartStart and Support Software CD is the intelligent way to configure your Compaq server with major operating system software. The SmartStart and Support Software CD helps you achieve a well-integrated server that ensures maximum dependability and supportability. For further information about configuration, see Chapter 5, "Server Configuration and Utilities."

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Disk Drive Fault Tolerance

Disk drive fault tolerance for Compaq servers is covered in more detail in the *Compaq Server Online Reference Guide* on the Systems Reference Library (SRL) CD. The following Redundant Array of Inexpensive Disks (RAID) types are supported:

- RAID 0 - no fault tolerance
- RAID 1 - mirroring
- RAID 4 - data guarding
- RAID 5 - distributed data guarding

Compaq Insight Manager

Compaq Insight Manger is a comprehensive management tool to monitor and control the operation of Compaq servers and clients. Compaq Insight Manager consists of two components: a Windows-based console application, and server-or-client-based management data collection agents. Starting with Compaq Insight Manager 4.0, the agents for Windows NT and Netware are also web-enabled; that is, these agents enable web browser access and monitoring of management information.

The management agents monitor over 1,000 management paramenters. Key subsystems are instrumented to make health, configuration, and performance data available to the agent software, The agents act upon that data, by initiating information, such as netword interface or storage subsystem performance statistics.

Key Features

- Compaq Remote Insight Board/PCI allows "in-band" network connection for server management.
- ProLiant Integrated Remote Console ensures customers are in touch with their systems, even when they are off-line or without power.
- Version Control and Integration Server Maintenance allows the administrator to monitor and update versions of the server and workstation firmware, drivers and utilities.

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- Web browser access for monitoring provides accessibility to Insight Manager Device and Configuration from anywhere you have network access and a standard web browser.
- Comprehensive fault management allows proactive management of the distributed enterprise by alerting you in advance of potential system failures.
- Comprehensive alarm notification notifies the administrator by digital or alphanumeric pager of any condition on the server client that may require action.
- Alarm forwarding supports the forwarding of short text messages to a Digital Wireless Phone using Global System for Mobile Communication (GSM/Short Messaging Service (SMS).
- Broad configuration management provides effective deployment and maintenance of consistent, manageable configurations with Insight Version Control and Integration Server Maintenance.
- Performance management/resource utilization helps the user determine how servers are utilized and if upgrades or updates are necessary to increase overall system performance.
- SNMP standards provide integration with other management products.
- Flexible network conductivity supports multiple transport protocols including IPX, TCP/IP and PPP to operate over LANs, WANs, and modems.
- Support for the following leading operating systems:
  - Microsoft Windows NT and Windows 95
  - Novell NetWare, intranetWare and IntranetWare for Small Business
  - SCO Unix, OpenServer, and UnixWare
  - ISM OS/2 Warp family of products

In Compaq servers, every hardware subsystem, such as disk storage, system memory, and system processor, has a robust set of management capabilities. Compaq Full-Spectrum Fault Management prevents faults before they happen, keeps the system up and running in the unlikely event of a failure, and delivers rapid server recovery to normal operation after a fault. See Chapter 5, "Server Configuration and Utilities," for more information.

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Automatic Server Recovery-2 (ASR2)

If there is a critical system failure, Automatic Server Recovery-2 allows you to restart the server and page a designated system administrator. For more information, see the *Compaq Server Online Reference Guide* on the Systems Reference Library CD (SRL).

Security Features

- Power-on password
- Administrator password
- Network server mode
- Diskette boot control
- Physically protected power switch
- Serial/parallel interface control
- Remote access password
- Front bezel lock (tower model only)

Refer to the *Compaq Server Online Reference Guide* on the Systems Reference Library (SRL) CD for more information on these security features.

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Compaq Integrated Remote Console

When the Compaq ProLiant 5500 server is equipped with an optional supported modem, you can perform a wide range of configuration activities using the standard Compaq Integrated Remote Console (IRC). The IRC:

- Is accessible using ANSI terminal
- Operates independently of the operating system
- Provides for remote server reboot
- Provides access to system configuration
- Uses out-of-band communication with dedicated management modem installed in the server

For more information about the IRC, see the *Integrated Remote Console Guide* included on the Documentation CD.

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Compaq Integrated Management Display

The Integrated Management Display (IMD) is an LCD display panel that assists you in diagnosing and servicing the server without using a keyboard and monitor. IMD is is standard on rack models and optional on tower models.

The features of the Integrated Management Display include:

- **Flexibility** - The Integrated Management Display rotates to support both tower and rack configurations.
- **Manageability** - Typical service and administrative information displayed includes:
  - POST (Power-On Self-Test) messages
  - User-defined administrative information
  - POST and run-time error events
  - System information
- **Ease of Use** - The Integrated Management Display provides a 16x4 character display and four button control panel to easily navigate through menus.

For information about using the IMD, see Chapter 6, "Integrated Management Display."

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Supported Drive Configurations

Standard server configurations can include as many as six Smart Array 3200 Controllers or SMART-2DH Controllers depending on the installed network operating system. The Smart Array 3200 Controllers or SMART-2DH Controllers can support two Compaq ProLiant Storage Systems, or one Compaq ProLiant Storage System and up to seven internal, hot-pluggable hard drives.

A maximum practical SCSI configuration, optimizing performance and storage, could include the following:

- One network interface controller (NIC)
- Six Smart Array 3200 Controllers or SMART-2DH Controllers
- Twelve Compaq ProLiant Storage Systems
- Ninety 18.2 GB drives

This configuration would yield a total storage capacity of 1.6 terabytes (1,638 gigabytes).

Interlock System

The Compaq ProLiant 5500 server interlock system prevents power distribution throughout the system if the memory board, processors, or peripheral board (including the power switch cable) are not fully installed or properly seated.

WARNING: Tooled access is required. Repair should be performed only by trained service providers who are qualified in servicing computer equipment and in dealing with products capable of producing hazardous energy levels.

WARNING: Care must be exercised when the hood or side covers are removed because the system does not shut down automatically.

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IMPORTANT: This server is not equipped with chassis interlocks. There are board interlocks that connect the memory board, processors, peripheral board and power switch cable into one interlock chain.

When one of the connected components in the interlock chain is improperly seated in the connector, the LED associated with the fault origination point will illuminate. See Table 1-1 and Figure 1-1 for details regarding the interlock error.

Table 1-1
LED Labels

Memory	CPU4	CPU3	CPU2	CPU1	I/O	Fault Origination
ON	ON	ON	ON	ON	ON	Memory Board
OFF	ON	ON	ON	ON	ON	Processor 4
OFF	OFF	ON	ON	ON	ON	Processor 3
OFF	OFF	OFF	ON	ON	ON	Processor 2
OFF	OFF	OFF	OFF	ON	ON	Processor 1
OFF	OFF	OFF	OFF	OFF	ON	Peripheral Board
OFF	OFF	OFF	OFF	OFF	OFF	No interlock error

NOTE: Only the left-most illuminated LED in any given row can provide a valid indication of the interlock error. After ensuring that server is powered down and power cables are disconnected, reseat the device associated with the left-most illuminated LED.

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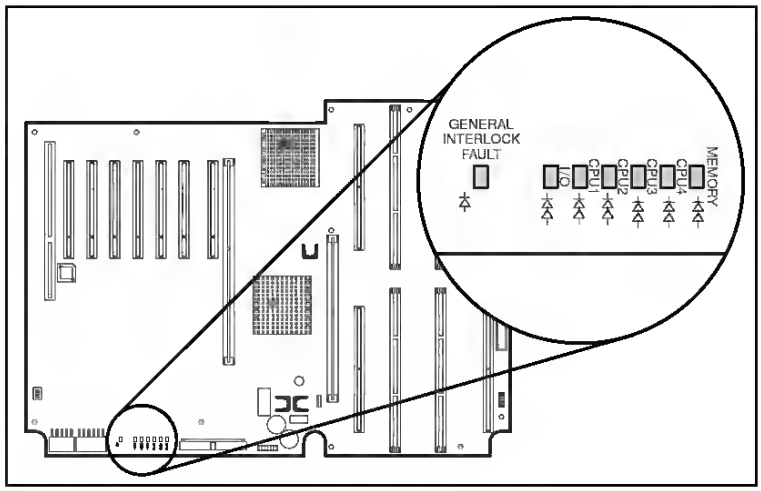

Figure 1-1. Interlock LEDs

Pre-Failure Warranty

Pre-Failure Warranty for Intel Pentium II Xeon processors, hard drives, power supplies, and DIMMs purchased from Compaq is available through an Authorized Compaq Reseller. Supported components are eligible for replacement under this warranty before they actually fail, if the system determines that these components have degraded below predetermined reliability thresholds within the product warranty period.

Insight Manager Alert

When Compaq Insight Manager alerts you that a component may be eligible for Pre-Failure Warranty replacement, follow the on-screen instructions or contact an Authorized Compaq Service Provider in your area.

Insight Manager Status Indicator

A yellow status indicator on the Insight Manager control panel indicates that a component is in a degraded condition. Compaq recommends that you replace a component that is in a prefailure condition.

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Chapter 2
Installation Overview

This chapter presents an overview of the installation and configuration procedure for Compaq ProLiant 5500 servers. You are referred to later chapters in this guide for detailed discussions of rack installation, hardware option installation, and configuration. Topics in this chapter include:

- **Server Warnings and Precautions** - This section presents the precautions and warnings necessary to ensure a safe installation of your server.
- **Pre-installation Planning** - This section discusses the power, grounding, and temperature requirements of the Compaq ProLiant 5500 server.
- **Installation Procedure** - This section is a summary of the steps you will follow to install your Compaq ProLiant 5500 server.

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Server Warnings and Precautions

WARNING: To reduce the risk of personal injury from hot surfaces, allow the hot plug drives and internal system components to cool before touching.

WARNING: To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded electrical outlet that is easily accessible at all times.
- Install the power supply before connecting the power cord to the power supply.
- Unplug the power cord before removing the power supply from the server.
- If the system has multiple power supplies, disconnect power from the system by unplugging all power cords from the power supplies

CAUTION: Protect the server from power fluctuations and temporary interruptions with a regulating uninterruptible power supply (UPS). This device protects the hardware from damage caused by power surges and voltage spikes and keeps the system in operation during a power failure.

CAUTION: The Compaq ProLiant Server must always be operated with the system unit cover on. Proper cooling will not be achieved if the system unit cover is removed.

IMPORTANT: Because of the 100 to 120 VAC electrical rating of each power supply, some local electrical authorities may require either one 15-Ampere circuit for each power supply or one 20-Ampere circuit for each pair of power supplies.

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Pre-installation Planning

This section discusses the power, grounding, and temperature requirements of the Compaq ProLiant 5500 server.

Power Requirements

WARNING: To reduce the risk of personal injury, fire, or damage to the equipment, do not overload the AC supply branch circuit that provides power to the server. Consult the electrical authority having jurisdiction over your facility wiring and installation requirements.

- The power load needs to be balanced between available AC supply branch circuits.
- The overall system AC current load must not exceed 80 percent of the branch circuit AC current rating.
- If power strips are used, the load should not exceed 80 percent of the power strip's marked electrical current rating.

The installation of this equipment shall be in accordance with Local/Regional electrical regulations governing the installation of Information Technology Equipment by licensed electricians. This equipment is designed to operate in installations covered by the National Electric Code (ANSI/NFPA 70, 1993) and the code for Protection of Electronic Computer/Data Processing Equipment (NFPA-75, 1992).

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This product is also designed for IT power systems with Phase to Phase voltage of 230 V.

For electrical power ratings on options, refer to the product's rating label or user documentation supplied with that option.

Grounding

For proper operation and safety, this equipment is required to be properly grounded in accordance with NFPA 70-1993, Article 250. All power distribution devices, branch wiring, and receptacles must be "Listed" grounding type devices.

When using power strips for electrical distribution, ensure that ground integrity is maintained for each connection made. Plug each component into a reliably grounded outlet.

Server Temperature Requirements

To ensure continued safe and reliable operation of the equipment, locate the system in a well-ventilated, climate-controlled environment.

The Compaq Maximum Recommended Ambient Operating Temperature (TMRA) for most server products is 35°C (95°F). Therefore, the temperature in the room where the rack is located should not exceed 35°C (95°F).

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Installation Procedure

There are two installation procedures presented in the following paragraphs. The procedure you will use depends on whether you are installing a rack-mount model or a tower model server.

Each procedure is a summary of the steps you will follow to install your Compaq ProLiant 5500 server. Detailed instructions for each of the general steps are included in later chapters of this guide.

Installing a Rack Mount Model

Below are the general steps for installing your rack-mountable ProLiant 5500 server:

- Select an appropriate site for your rack. See the *Rack Planning and Installation Guide* on the "Compaq Installing Rack Products CD" for site selection criteria.
- Make sure that stabilizer feet are installed on the rack.
- Unpack the server.
- Unpack the rack mounting hardware.
- Install any hardware options in the server. See Chapter 4 and the options kits for detailed instructions.
- Install SCSI drives in the server only after you load the server into the rack. You may also lighten the server by removing the power supplies and reinstalling them after you have mounted the server in the rack.
- Set switches: peripheral board switches, system board switches, and SCSI ID settings.
- Attach rack mounting hardware to the rack and to the server. See Chapter 3 for detailed instructions.
- Slide the server into the rack. See Chapter 3.
- Attach the cable management arm to the cable management arm bracket. See Chapter 3.
- Connect cables: keyboard, mouse, monitor, network, and power cables. See Chapter 7.

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- Turn on the computer and insert the SmartStart and Support Software and Support Software CD to configure and manage the server. When the server boots from the SmartStart and Support Software program, it automatically starts the System Configuration Utility. See Chapter 5 for detailed information.
- Register your server.

For complete details on the SmartStart and Support Software program, read the SmartStart and Support Software installation card included in your SmartStart and Support Software package.

After the SmartStart and Support Software program has finished configuring your system, you have completed the installation of your new Compaq server.

Installing a Tower Model

Below are the general steps for installing your tower model ProLiant 5500 Model 6/400-512 server:

- Unpack the server.
- Install any hardware options in the server. See Chapter 6 for installing the Integrated Management Display in your tower model. See Chapter 4 and the options kits for detailed instructions on installing other options and components.
- Set switches: peripheral board switches, system board switches, and SCSI ID settings.
- Connect cables: keyboard, mouse, monitor, network, and power cables. See Chapter 7.
- Turn on the computer and insert the SmartStart and Support Software and Support Software CD to configure and manage the server. When the server boots from the SmartStart and Support Software program, it automatically starts the System Configuration Utility. See Chapter 5 for detailed information.
- Register your server.

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For complete details on the SmartStart and Support Software program, read the SmartStart and Support Software installation card included in your SmartStart and Support Software package.

After the SmartStart and Support Software program has finished configuring your system, you have completed the installation of your new Compaq server.

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Chapter 3
Rack-Mount Server Installation

This chapter covers the following information:

- How to attach the mounting hardware to the server and to the rack
- How to install the server into the rack

You may choose Compaq's optional installation service to install your rack products. See "Optional Installation Service" at the end of this chapter.

Rack Warnings and Precautions

Before beginning these procedures, make sure you understand the following warnings and cautions.

WARNING: To reduce the risk of personal injury or damage to the equipment, at least two people are needed to safely unload the rack from the pallet. An empty 42U rack weighs 253 lb (115 kg), is over seven ft (2.1 m) tall, and may become unstable when being moved on its casters. Do not stand in front of the rack as it rolls down the ramp from the pallet, but handle it from the sides.

WARNING: Because the rack allows you to stack computer servers on a vertical rather than a horizontal plane, you must take precautions to provide for rack stability and safety. It is important that you follow these basic instructions to protect both personnel and property, and that you heed all cautions and warnings throughout the installation instructions.

WARNING: Always load the heaviest item first and always load the rack from the bottom up. This will make the rack "bottom-heavy" and help prevent the rack from becoming unstable. See "Rules for the Rack Builder" on the "Compaq Installing Rack Products CD" for the rules that govern the vertical placement of rack-mounted servers.

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WARNING: A rack may become unstable if more than one server is extended for any reason. To reduce the risk of personal injury, always ensure that the rack is adequately stabilized before extending a server outside the rack, and extend only one server at a time.

WARNING: Before beginning to work on the rack, be sure that the leveling jacks are extended to the floor, that the full weight of the rack rests on the level floor, and that either stabilizers are installed or that multiple racks are coupled together for stability.

WARNING: To avoid the risk of personal injury or damage to the equipment, a minimum of two people **MUST** lift the server into the rack. The server weighs in excess of 92 lb (41.8 kg). If the unit is to be loaded above chest level, a third person must assist in aligning the rails while the other two support the unit.

CAUTION: Do not place anything on power cords or cables. Arrange them so that no one may accidentally step or trip over them. Do not pull on a cord or cable. When unplugging from the electrical outlet, grasp the cord by the plug.

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Airflow Requirements

Compaq ProLiant rackmount servers draw cool air in through the front door and exhaust warm air out the rear. Therefore, the front door of the rack must be adequately ventilated to allow ambient room air to enter the cabinet, and the rear door must be adequately ventilated to allow the warm air to escape from the cabinet. Do not block the ventilation apertures.

CAUTION: If a third-party rack is used, the following minimum requirements should be observed to ensure adequate airflow and to prevent damage to the equipment:

Front: The front must have a minimum of 25 inches of unrestricted ventilation.

Side: The clearance between the installed module and the side panels of the rack should be a minimum of 2.75 inches.

Rear: The clearance between the back of the rack and the wall should be a minimum of 30 inches. The equipment should be operating without a rear door.

NOTE: If all of the vertical space in the rack is not filled by servers, the gaps that are left cause a change in airflow through the rack and across the servers. These gaps should be covered with blanking panels.

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Unpacking the Server

Unpack the server box and locate the materials and documentation necessary to install your rack-mountable server.

Optional Installation Service

The installation service covers the entire hardware installation from unpacking the servers to routing the cables and running a test of the system. In the United States, Compaq will make all of the arrangements to have the rack system installed by qualified Guaranteed Service Providers. An order form with pricing is available from PaqFax, the Compaq fax retrieval service.
Call 1-800-345-1518, select PaqFax, and request Document No. 4552.
Installation may also be ordered from and provided directly by Authorized Compaq Service Providers.

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Locating Materials and Documentation

All of the equipment needed to install the ProLiant 5500 server in the rack is included with the rack and with the server.

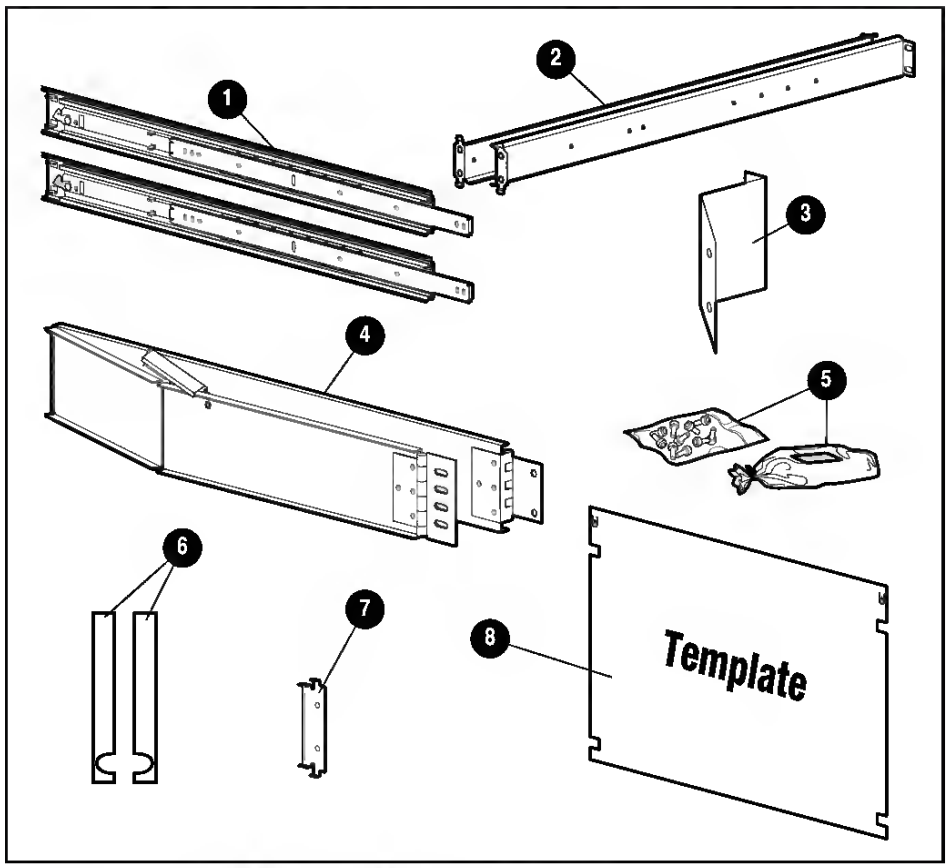

Figure 3-1. Rack mounting hardware included with the server

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Contents of the rack model server box include

- Compaq ProLiant 5500 server
- Cables
- Rack mounting hardware (numbers reference Figure 3-1)
  - ❶ One pair 26-inch slide rail assemblies
  - ❷ One pair slide rail mounting brackets
  - ❸ Cable management arm server bracket
  - ❹ Cable management arm
  - ❺ Mounting hardware
  - ❻ Plastic rail covers (2)
  - ❼ Cable management arm rack bracket
  - ❽ Template to mark the rack for proper attachment of the rack mounting brackets
- Documentation and software
  - ❑ *Server Setup and Management Package*
  - ❑ *Compaq Installing Rack Products CD*
  - ❑ *CompaqCare folder*
  - ❑ *Compaq Product Quality Statements*
  - ❑ *Owner's Registration folder*

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Rack Resource CD Kit

The Compaq Installing Rack Products CD is included with your server. The Rack Builder Configuration CD and the Rack Information Library CD can be found on the web on the Compaq website at www.compaq.com. The entire *Rack Resource CD Kit* PN 298721-001 ships with all Compaq racks and can be ordered through a Compaq authorized reseller. A summary of the content of each CD follows:

- Rack Builder Configuration Tool CD

This CD allows you to simulate potential Compaq Rack configurations based on your input. Rack Builder provides the information such as:

  - Graphical preview of properly configured racks
  - Site planning data, including power requirements, cooling mandates, and physical specifications
  - Ordering information, including required servers, part numbers, and appropriate quantities

- Installing Rack Products CD

This set contains several CDs which give a visual overview of operations required to configure a Compaq rack with rack-mountable servers. This video covers key configuration steps such as:

  - Site planning
  - Installation of rack-mountable servers and rack options
  - Cabling
  - Coupling multiple racks together

- Rack Information Library CD

This CD allows you to view, search, and print documentation for Compaq racks and rack options. It also assists in the setup and optimization of your new Compaq rack to best fit the needs of your environment.

In addition to these supplied items, you may need:

- Torx T-15 screwdriver
- Phillips screwdriver

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- Slotted screwdriver
- Application software diskettes, such as SmartStart and Support Software
- Options to be installed, such as
  - Optional monitor, keyboard, etc.
  - Integrated Management Display (tower model only)
  - Array Controller
  - Redundant fans

Preparing the Mounting Brackets and Slide Rail Assemblies

Each pair of mounting brackets, with attached slide rail assemblies supports one rack-mountable server.

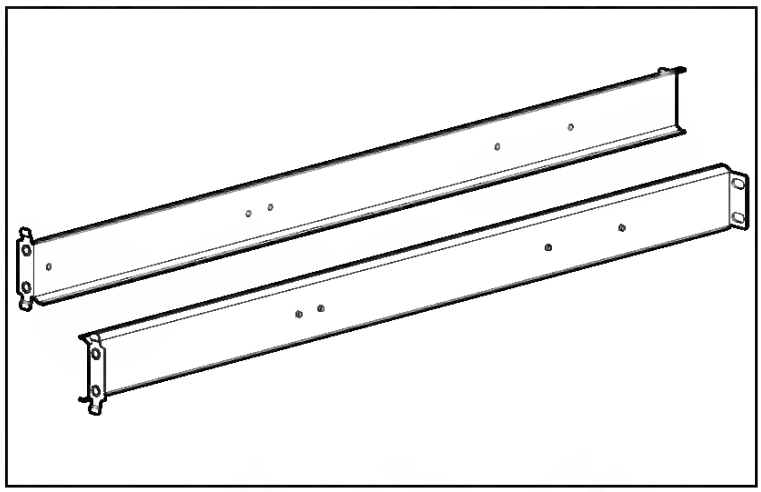

Figure 3-2. Rack mounting brackets; alignment tabs identify the front flanges

Each slide rail assembly consists of an outer bracket rail and an inner server rail (see the following figure). These pieces can be separated; the bracket rails attach to the rack mounting brackets (shown in the previous figure), and the server rails attach to the sides of the server chassis.

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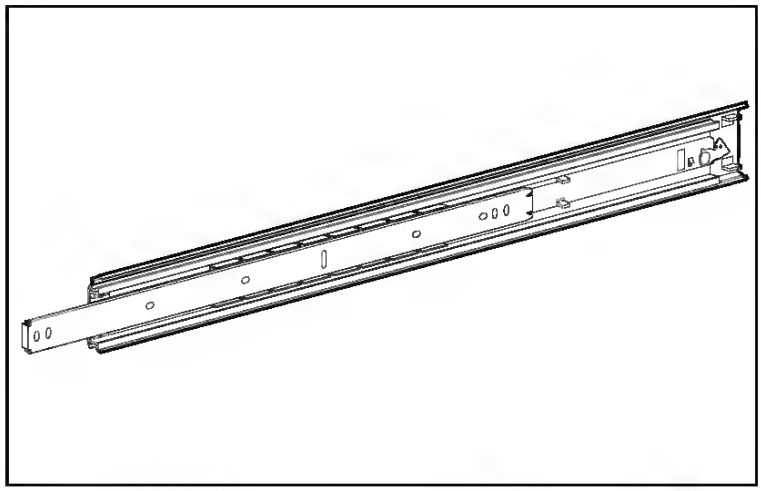

Figure 3-3. Slide rail assembly (outer bracket rail and inner server rail)

IMPORTANT: To make the installation of the mounting bracket easier, attach the bracket rail to the rack mounting bracket before attaching the mounting bracket assembly to the rack. This way, the joined mounting bracket and bracket rail can be fastened to the rack as one assembly.

Attaching the Bracket Rail to the Mounting Bracket

Please read all of the following eight steps before you begin.

1. Unpack the hardware mounting kit. Lay the two-piece slide rail assembly (outer bracket rail and inner server rail) and fasteners on a flat surface along with the mounting brackets and fasteners that came with the rack.

Extend the server rail from the bracket slide rail until the server rail release latch clicks. Holding down the latch, slip this piece out of each bracket rail, as shown in the following figure.

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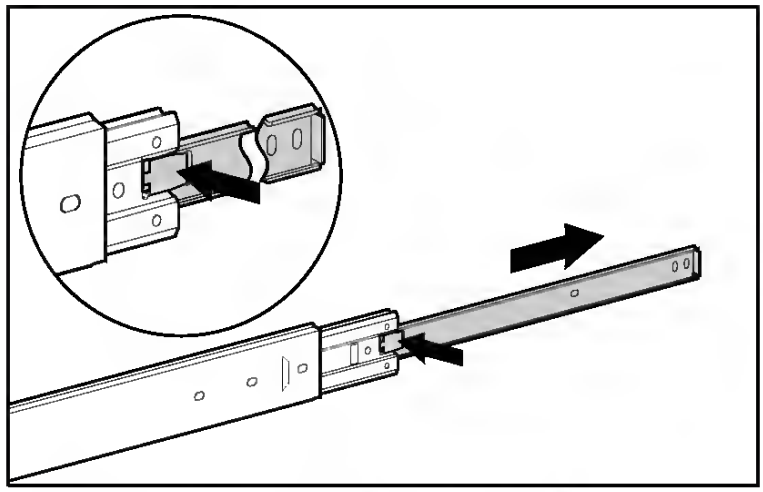

Figure 3-4. Removing the server rail from the bracket rail

2. Put the server rails to one side. You will attach them to the rack server chassis later, in the section, "Attaching Server Rails."

The next figure shows the separated bracket rail with its inner sliding piece and the flat, one-piece server rail.

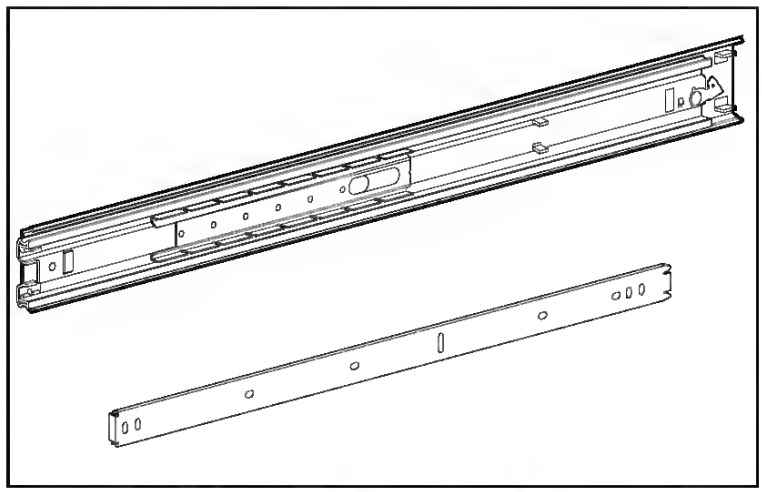

Figure 3-5. Separated bracket rail (top) and server rail

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The bracket rail consists of a fixed outer rail that screws to the rack mounting bracket, and an inner slide on a steel ball bearing movement. This inner slide does not detach.

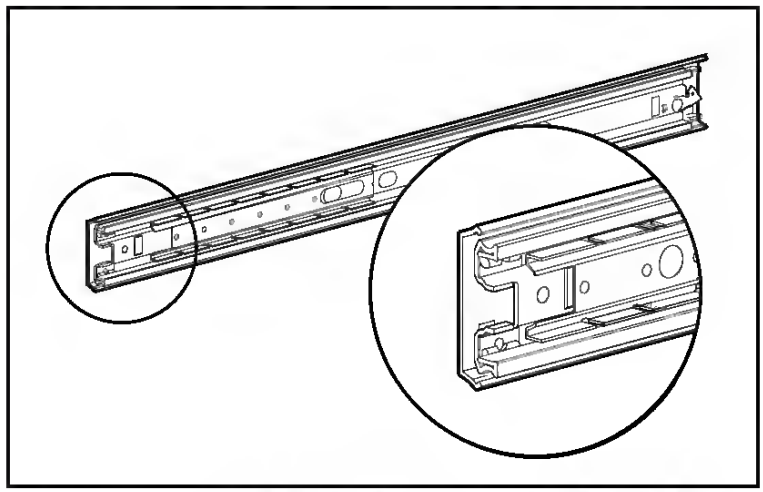

Figure 3-6. Bracket rail with inner slide. The front of the rail is highlighted.

3. Lay the bracket rail inside the mounting bracket with the front of both pieces oriented in the same direction. Align the front screw holes in the mounting bracket and the bracket rail.

   To identify the front of the mounting bracket and the bracket rail:

   - ❑ The front of the mounting bracket has alignment tabs on its flange.
   - ❑ The front of the bracket rail allows the inner slide to move forward on ball bearings.

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4. Extend the inner slide from the front of the bracket rail. With this piece extended, you will see two screw holes aligned in the mounting bracket and the bracket rail. These are the two exposed holes near the back end of the bracket rail and the front hole accessible through a slot in the inner slide.
5. Fasten the bracket rail to the mounting bracket with two 8-32 x 1/4-inch slotted screws. (Do not use nuts or washers with the screws.) See step ❶ of the following figure.
6. Adjust the inner slide to access the other two screw holes, one at a time, through the slotted opening in the inner slide. Use two more 8-32 x 1/4-inch slotted screws to fasten the bracket rail to the mounting bracket. See steps ❷ and ❸ of the following figure.

The following figure shows inserting the screws into the appropriate holes. The screws will line up with the 26-inch markings stamped along one edge of the mounting bracket. These marks identify the mounting holes for the 26-inch slides used in Compaq racks. (The other markings stamped along the opposite edge are for use with slides that support other servers.)

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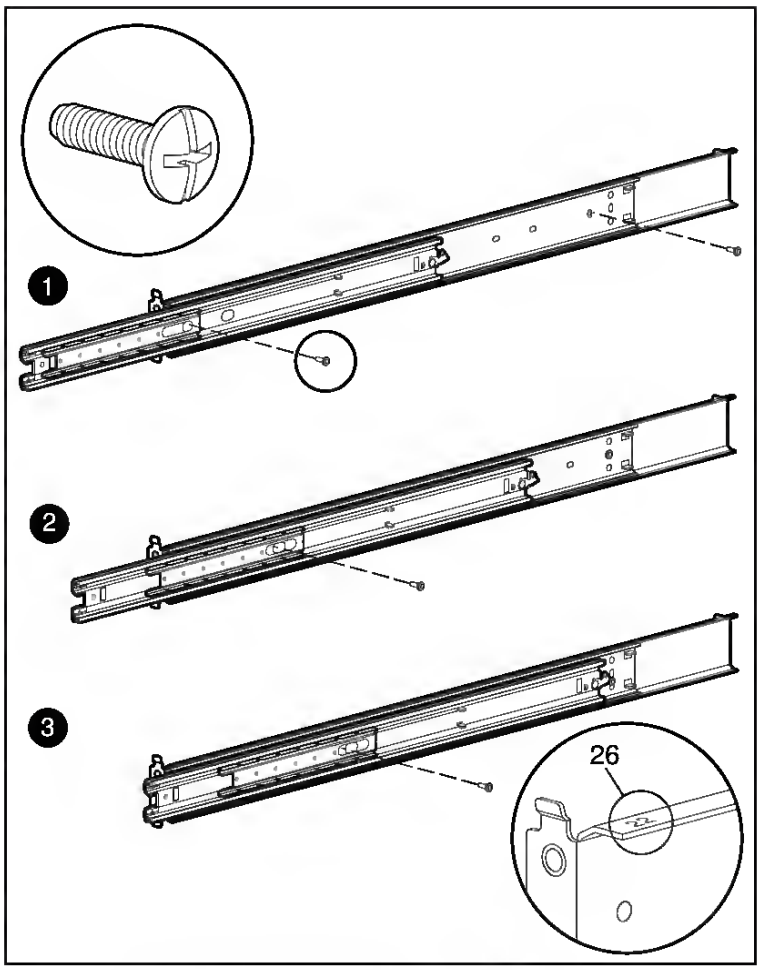

Figure 3-7. Attaching the bracket rail to the mounting bracket

You will use a total of four 8-32 x 1/4-inch slotted screws to fasten the bracket rail to the mounting bracket. When all four screws are fastened, the mounting bracket and bracket rail form a mounting bracket slide assembly that you will attach to the rack.

7. Repeat steps 4 through 7 with the other bracket rail and mounting bracket. You now have a pair of mounting bracket slide assemblies to be attached to the rack.

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Attaching the Mounting Bracket Slide Assembly to the Rack

WARNING: To reduce the risk of personal injury or damage to the equipment, be sure that the rack leveling feet are extended to the floor and support the full weight of the rack. Each rack must be level and stable. Racks that are not coupled together require the installation of stabilizers. This **must** be done before you perform any work on the rack.

See the *Rack Planning and Installation Guide* included on the "Compaq Installing Rack Products CD" for more information on leveling feet and stabilizers.

Measuring with the Template

The template provided with the server offers an easy and reliable way to properly position the server in the rack. Use the tabs on the template to suspend it from the **lower** hole of a two-hole set of perforations in the vertical side rails. Pencil mark the attachment points for the mounting bracket assemblies, the cage nuts for the face-plate thumbscrews, and the top of the server. Use the tick marks on the rack side rails to insure level installation of the server. See illustrations and instructions printed on the template.

IMPORTANT: Determine the server's place in the rack **before** you start installing the mounting bracket assemblies. To remind you of the proper placement of the server in the rack, refer to the Rack Builder report you printed when you planned your rack configuration. Always mount the heaviest item on the bottom of the rack and work from the bottom to the top.

1. Starting at the bottom of the rack, or at the top of a previously mounted server, measure the screw hole locations for the server's mounting bracket assemblies. Pencil mark the locations on the outside of the rack. Do this on both the front and the back of the rack.

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IMPORTANT: The template is two-sided (front and back) and printed with arrows that show you where the screws will be inserted, both for the mounting bracket assemblies and for the thumbscrews that will secure the server's face plate to the front of the rack.

Align the template carefully with the holes on the rack, to determine the exact placement of the screws.

2. When you mark the positioning of the mounting bracket screws, also mark the positioning in the front of the rack for the cage nuts. These are two slots marked "C" on the template. The cage nuts will hold the thumbscrews through the server's face plate.

   Be sure to follow the alignment instructions on the template, and keep the sides of the template squared up with the sides of the rack. Tick marks on the rack's vertical rails will help you maintain the proper alignment.

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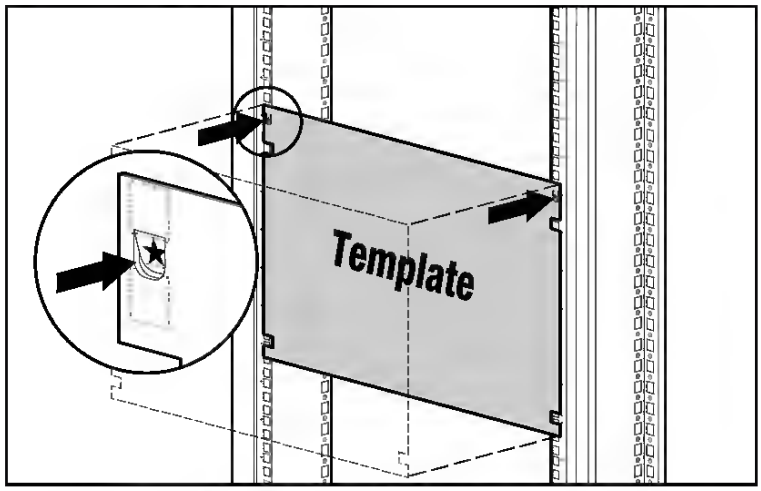

Figure 3-8. Measuring with the template

3. After marking the front of the rack, flip the template over and mark the back rails of the rack. Open the rear door of the rack to access the back rails.

4. On the back of the rack, also mark the rail to show the top of the template. This will help you align a template for the next server.

Inserting Cage Nuts in the Rack Frame

After marking the positions for the fasteners in both the front and back of the rack, use the fitting tool to insert cage nuts on the **inside** of the rails at the marked locations. The cage nuts and fitting tool are included in the hardware kit supplied with the rack.

1. Position the cage nut as shown in the following figure, on the inside of the rail.

2. Hook one of the lips of the cage nut through the square rail perforation.

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3. Insert the tip of the fitting tool through the other side of the perforation and hook the opposite lip of the cage nut.

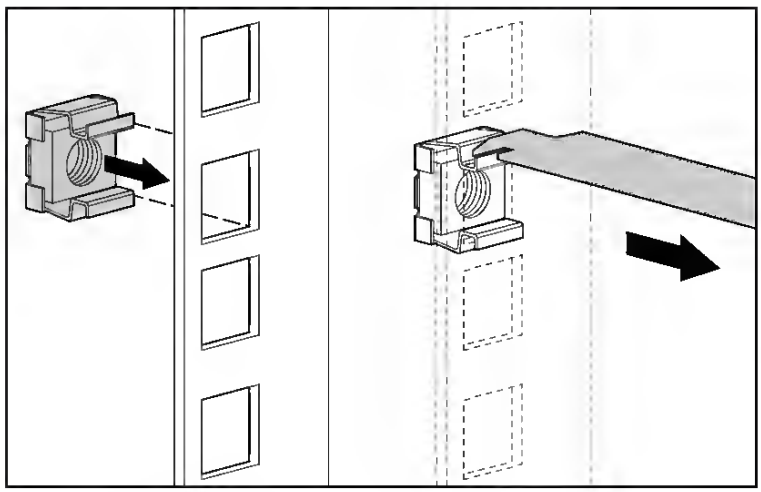

Figure 3-9. Inserting cage nuts

4. Using the fitting tool as a lever, pry the cage nut into position.

5. Repeat for each cage nut.

Attaching the Mounting Bracket Assembly to the Rack

The tabs on the front of the mounting bracket help to align it with the front of the rack frame. Cage nuts are not used for the front attachment of the mounting bracket.

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1. Attach a mounting bracket assembly to the front of the rack first, using one M6 x 1.0-12L Phillips screw in the bottom hole of the bracket. Do not use the washers supplied with the Compaq rack.

IMPORTANT: Use only the bottom hole of the bracket as shown in Figure 3-10.

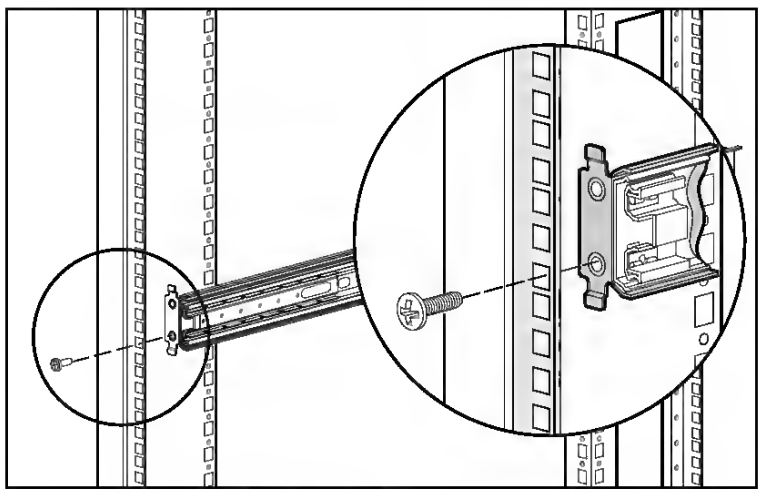

Figure 3-10. Attaching mounting bracket assembly to the front of the rack

2. Carefully align the mounting bracket assembly with the rear rack frame.
3. Secure the back end of the mounting bracket assembly to the back corner brace of the rack with one M6 x 1.0-12L Phillips screw through the bottom hole of the bracket and the cage nut, as shown in the following figure.

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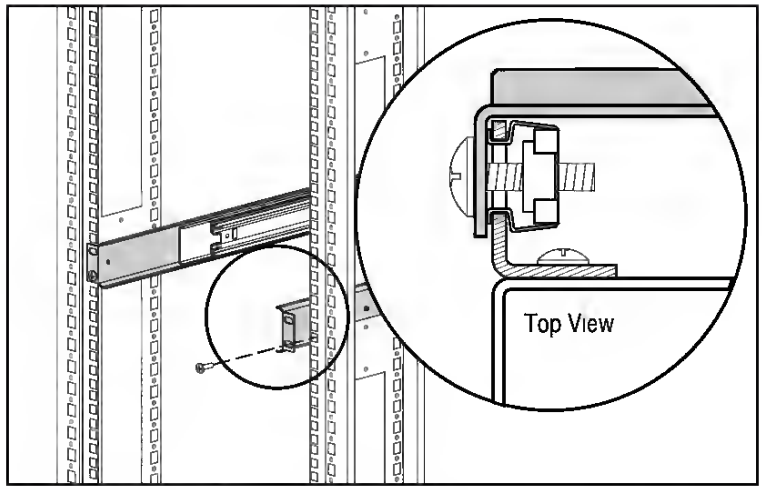

Figure 3-11. Cage nut and back of mounting bracket assembly installed

4. After attaching both of the mounting bracket assemblies to the rack, prepare the server for mounting in the rack.

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Attaching Server Rails

1. Place the tab on a server rail at the front of the server chassis. The holes in the server rail will line up only one way with the chassis.
2. Attach the flat side of a server rail to each side of the server chassis with four 8-32 x 1/4-inch Phillips screws. Do not use washers with the screws.

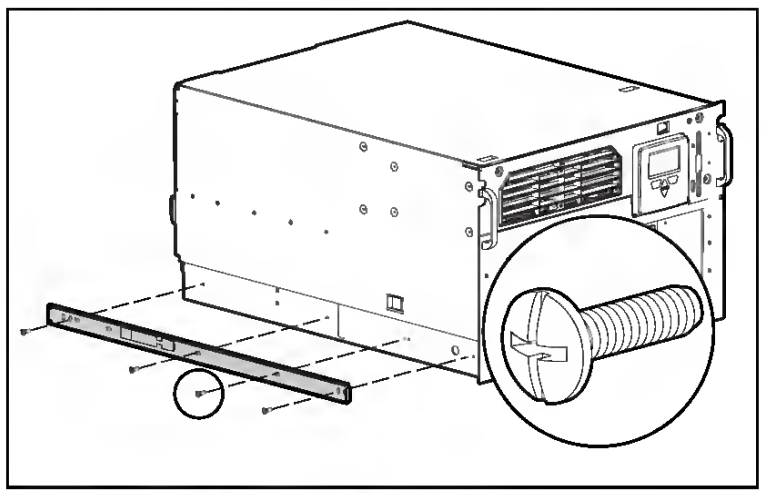

Figure 3-12. Attaching a server rail to the server

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Attaching the Cable Management Arm Component Bracket

As viewed from the rear of the server, the cable management arm server bracket fastens to the top left rear of the rack server's chassis. The bracket provides an attachment point for the cable management arm from the server to the rear frame of the rack. To attach the cable management arm server bracket:

1. Attach the cable management arm bracket to the back of the server with two
   6-32 x 1/4 Phillips screws.
2. Attach the rack rail covers to the rack.

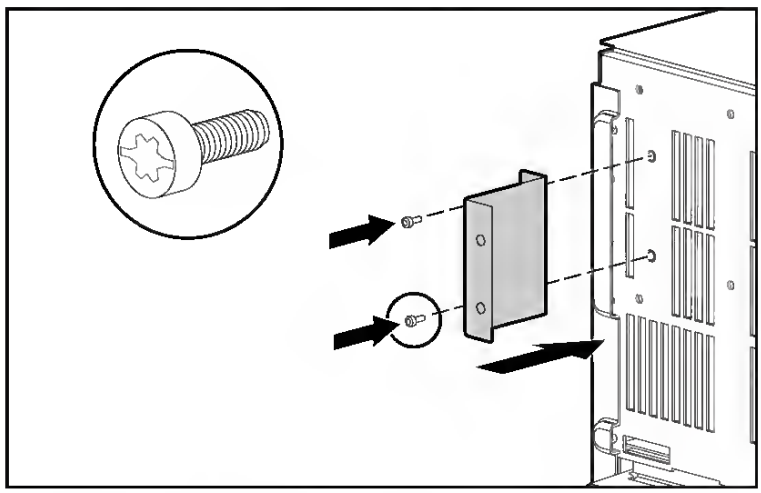

Figure 3-13. Attaching a cable management arm server bracket to the server

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Loading the Rack Server

Load and secure the server to the rack with the face plate thumbscrews before continuing to attach any more mounting bracket assemblies. Ensure that this pair of brackets is perfectly aligned and installed and that the server fits before you continue.

WARNING: To reduce the risk of personal injury or damage to the equipment, a minimum of two people **MUST** lift the server into the rack. The server weighs in excess of 92 lb (41.8 kg). If the unit is to be loaded above chest level, a third person must assist in aligning the rails while the other two support the unit.

IMPORTANT: To make the server lighter and more manageable, do not install drives in the server until after you load the server into the rack. You may also temporarily remove power supplies and reinstall them after you have mounted the server in the rack.

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1. Pull the slide rails forward from the mounting brackets.
2. Carefully align the server's server rails with the rack's slide rails and slide the server into the rack.

CAUTION: Be sure to keep the server parallel to the floor when sliding the server rails into the slide rails. Tilting the server up or down could result in damage to the rails.

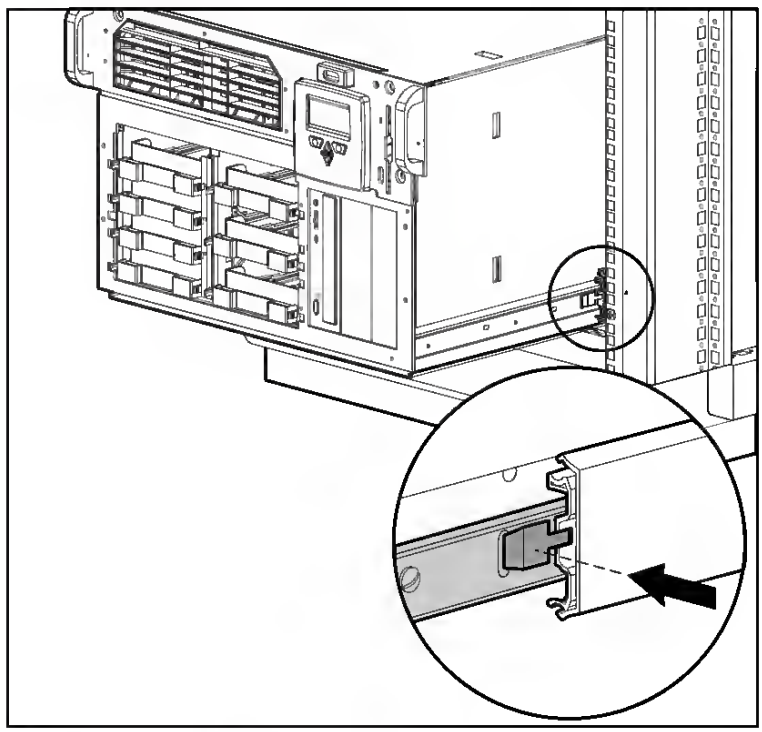

Figure 3-14. Loading the rack server

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WARNING: To reduce the risk of personal injury, be careful when pressing the server rail release latches and sliding the server into the rack. The slide rails could pinch your fingertips.

3. Press the server rail release latch on either side of the server and slide the server into the rack.

IMPORTANT: The first time you slide the server into the rack, you may have to apply some pressure. After the first time, the ball bearings in the slide will move easily.

IMPORTANT: When servicing the server, fully extend the server until the latches lock. To return the server to the rack, depress the latches and slide the server into the rack.

4. Secure the server face plate to the front of the rack by screwing the thumbscrews into the cage nuts.
5. Tighten the thumbscrews before you close the rack door to prevent the door from hitting protruding thumbscrews.

Attaching the Cable Management Arm

A double-hinged cable management arm and fasteners ship with each server. The cable management arm attaches to the server's cable management arm bracket and to the rear frame of the rack. All cables to and from the server are tied to this arm. The two hinges allow the cable management arm with attached cables to swing out of the way when you need to access the server pull-out trays.

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1. For easier handling, first slide the server into the rack, then attach the cable management arm to the cable management arm bracket. If you attach the arm before loading the server in the rack, the arm may swing around and interfere with the loading process.

2. After you have loaded the server into the rack, attach one end of the cable management arm to the server's cable management arm bracket using two M6 x 1.0-12L Phillips screws. Align the arm to the bracket as shown in the following figure.

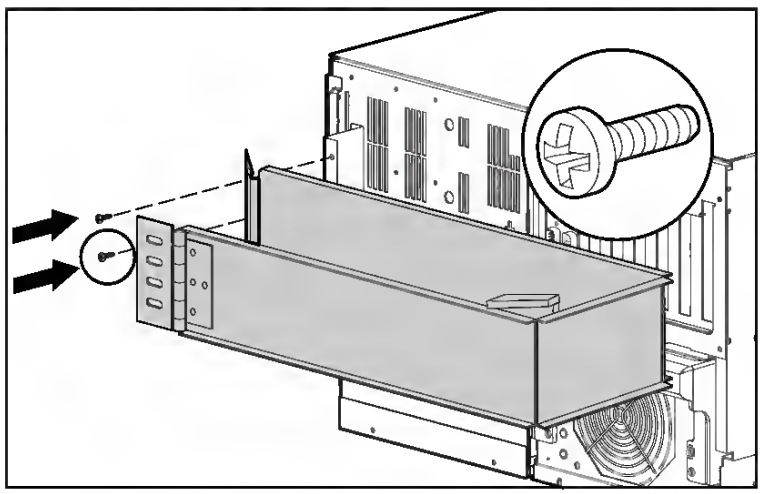

Figure 3-15. Attaching the cable management arm to the cable management arm bracket

3. Align the other end of the cable management arm on the outside of the rear brace of the rack. Align a screw retaining plate on the inside of the rack. Attach the arm to the rack with two 10-32 x 5/8-inch Phillips washer-face hex-head screws.

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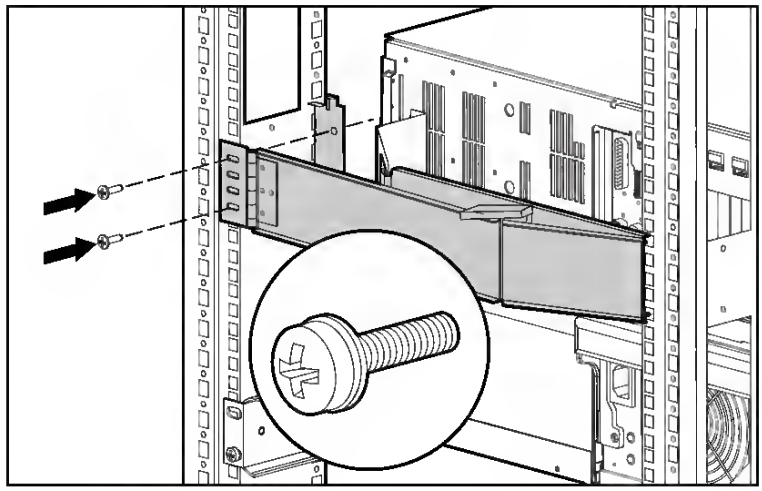

Figure 3-16. Attaching the cable management arm to the rear brace of the rack

4. Attach and secure external cables for keyboard, mouse, monitor, network and power as shown in Figure 3-17. See Chapter 7, "Cabling," for external cabling connector locations.

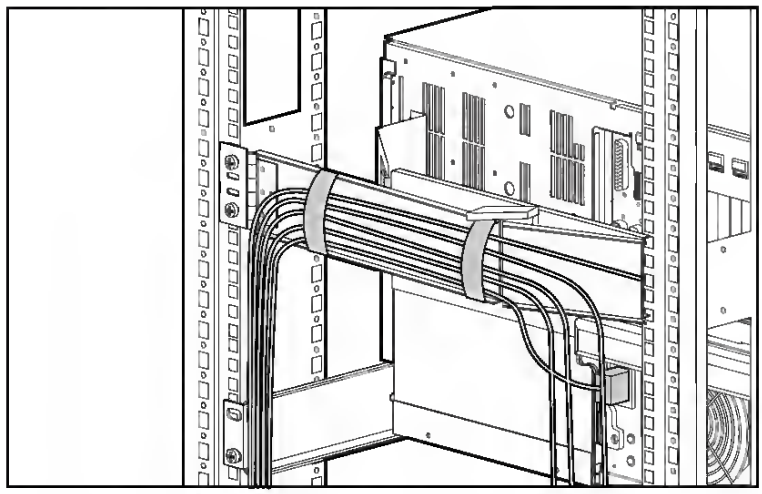

Figure 3-17. Attaching and securing external cables

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Chapter 4
Installing Hardware Components

This chapter is divided into two major parts as follows:

- **Accessing Non Hot-Plug Areas** - you must shut down the server power and remove the power cord(s) from the power supplies in order to install options, upgrades or replacements in the following areas:
  - Intel Pentium II Xeon Processors
  - Memory board and sockets
  - System board
  - Peripheral board
  - Drive cage backplane board
  - One shared PCI/ISA slot
  - Six PCI slots
  - Fans
  - Power supply lock
  - Integrated Management Display (tower model only)
  - Duplex drive cage
- **Accessing Hot-Plug Areas** - you can install hot-plug options, including hot-plug power supplies and SCSI hard drives, and upgrades or replacements without shutting down the power in the SCSI drive bay area.

  NOTE: The illustrations in this chapter may vary slightly depending on whether you have a tower model or rack model.

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Preparing the Server

To install options, upgrades or replacements in the following areas, you must first shut down the server power.

Accessing Processors, Memory Board and Sockets, and System and Peripheral Boards

WARNING: To reduce the risk of electrical shock or damage to the equipment, disconnect power from the server by unplugging all power cords from either the electrical outlet or the server.

WARNING: To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching.

WARNING: Repair should be performed only by qualified Service Providers who are trained in servicing computer equipment and in dealing with products capable of producing hazardous energy levels.

CAUTION: Electrostatic discharge can damage electronic components. Be sure you are properly grounded before beginning any installation procedure.

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1. Back up your server data.
2. Shut down the operating system in an orderly manner as directed in your operating system instructions.
3. Power down the server and remove the power cord(s).

WARNING: Before removing the server top panel, ensure that the server is turned off and that the power cord is disconnected from the electrical outlet.

IMPORTANT: The system power in the ProLiant 5500 server does not completely shut off with the front panel Power On/Standby switch. The two positions of the switch function as ON and STANDBY, rather than ON and OFF. The STANDBY position removes power from most of the electronics and the drives but portions of the power supply and some internal circuitry remain active. Consequently, to completely remove all power from the system, you must disconnect the power cord from the server. In systems with multiple power supplies, you must disconnect **all** the power cords to completely remove power from the system.

4. Disconnect any other external equipment connected to the computer.
5. Loosen the two thumbscrews on the front of the unit.
6. Loosen the Torx T-15 screw on the front of the server.

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7. Slide the side cover toward the rear of the unit about 1 inch (2.5 cm); then remove the cover.

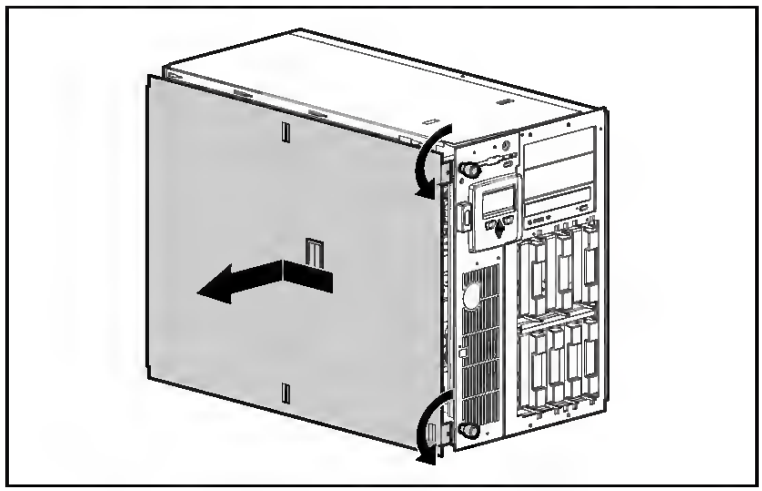

Figure 4-1. Removing the server cover

Accessing the Processor

The ProLiant 5500 server is shipped with one processor module and three terminator boards which fill all of the processor sockets. When adding processors, first remove the terminator board and then install the processor and Processor Power Module (PPM).

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1. To add a processor, identify the processor locations as shown in Figure 4-2.

   NOTE. Processors can be installed in any processor socket. All four processor sockets must have either a processor module or a terminator board installed for proper bus termination.

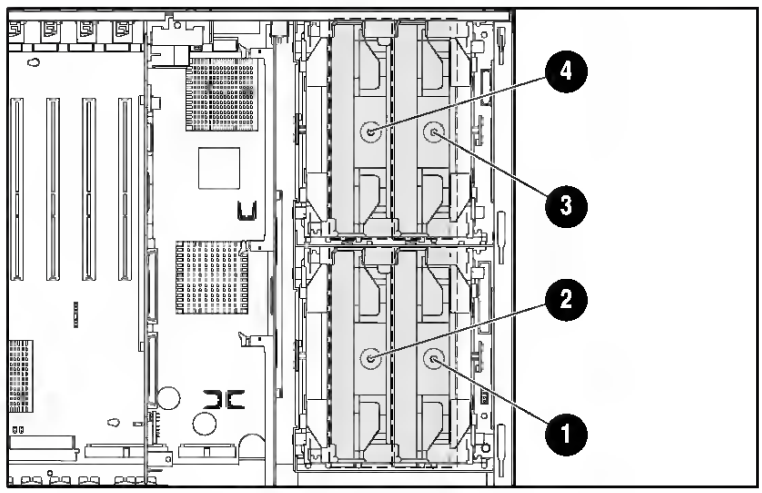

Figure 4-2. Processor locations

2. Remove one of the terminator boards by turning the retaining knob counterclockwise, releasing the side tabs and pulling up as shown in Figure 4-3.

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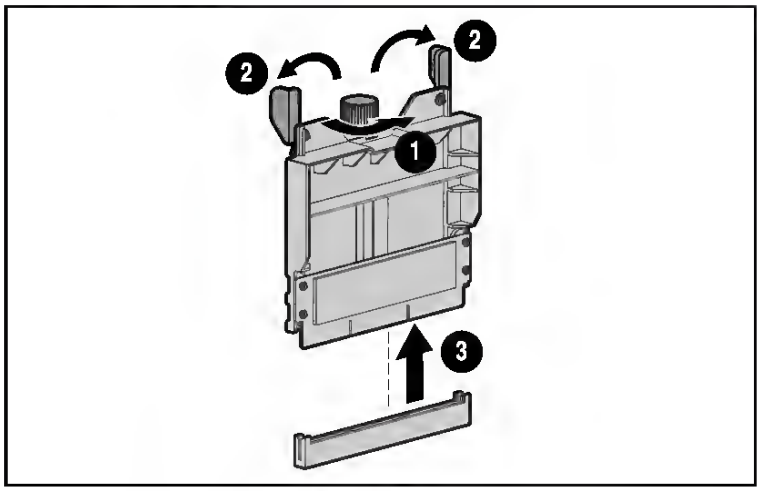

Figure 4-3. Removing the terminator board

3. See Figure 4-4 below for processor installation procedure.

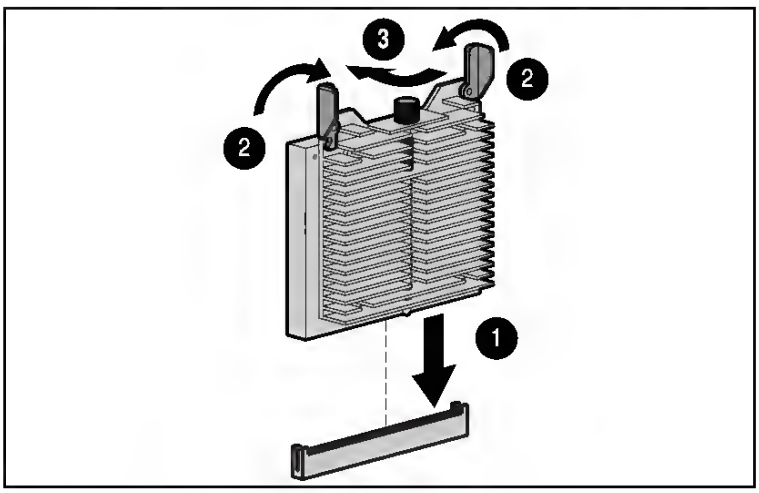

Figure 4-4. Installing the Intel Pentium II Xeon Processor

4. Install the processor power module (PPM) in the slot next to the processor as shown in Figure 4-5.

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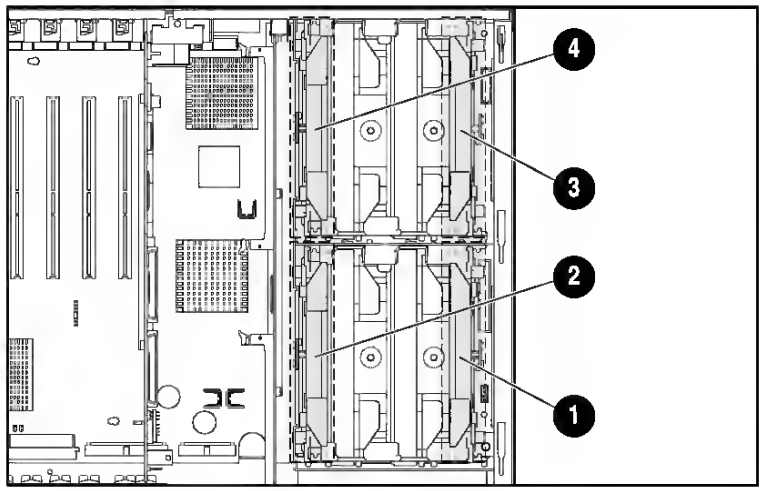

Figure 4-5. Processor power module locations

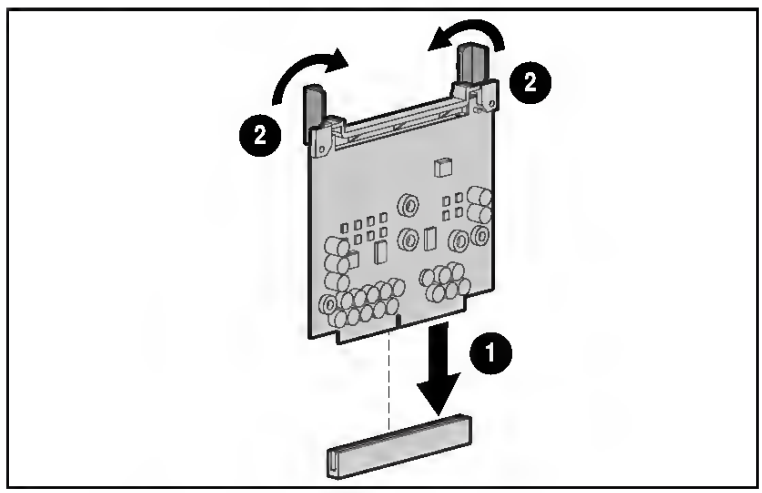

Figure 4-6. Installing the processor power module

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Accessing DIMM Sockets on the Memory Board

1. Power down the server.
2. Remove the memory board as shown in Figure 4-7.

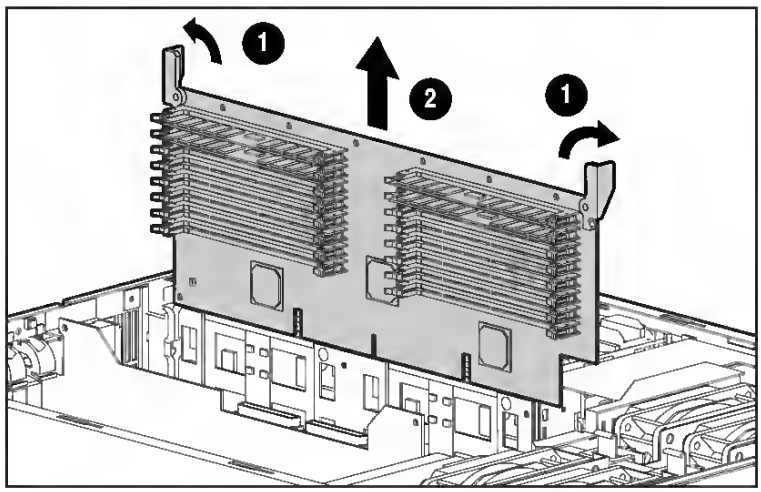

Figure 4-7. Removing the memory board

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3. Install DIMMs as shown in Figure 4-8. For information on memory banks, see the following section titled "Memory Banks."

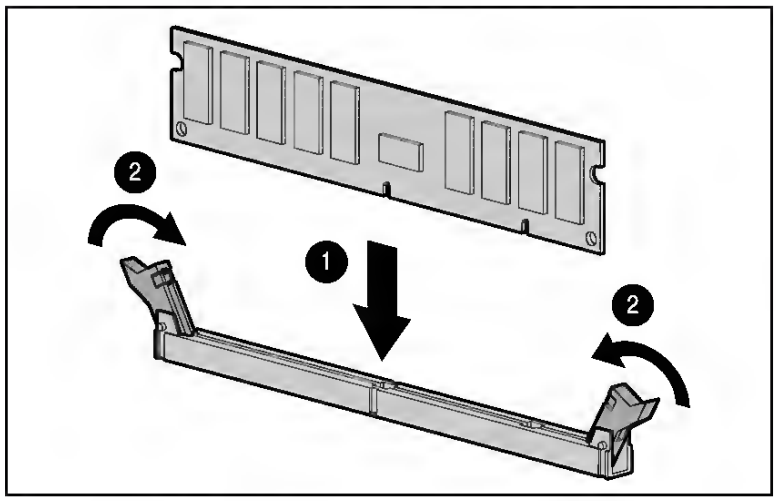

Figure 4-8. Installing a DIMM

4. Install the memory board as shown in Figure 4-9.

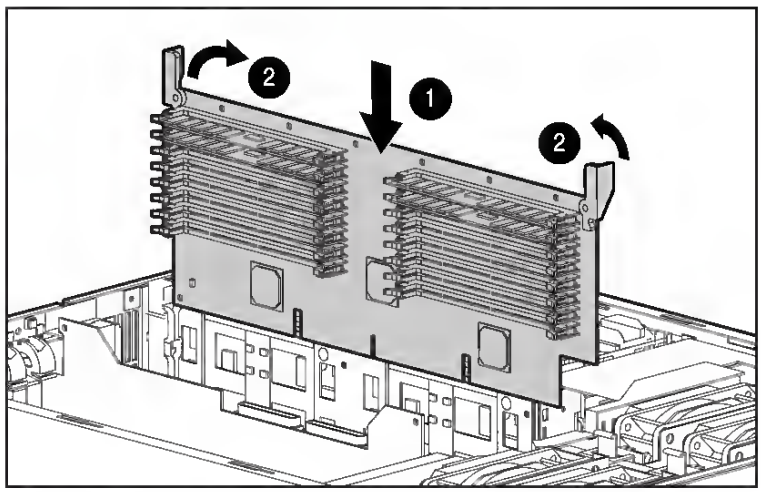

Figure 4-9. Installing memory board

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Memory Banks

In the Compaq ProLiant 5500 server, the Memory board is grouped into 4 banks where 1 bank is 2 DIMMs adjacent to 2 other DIMMs as shown below for bank 1. When memory is added, you must add 1 bank at a time. Memory banks are also identified on a label on the inside of the access panel.

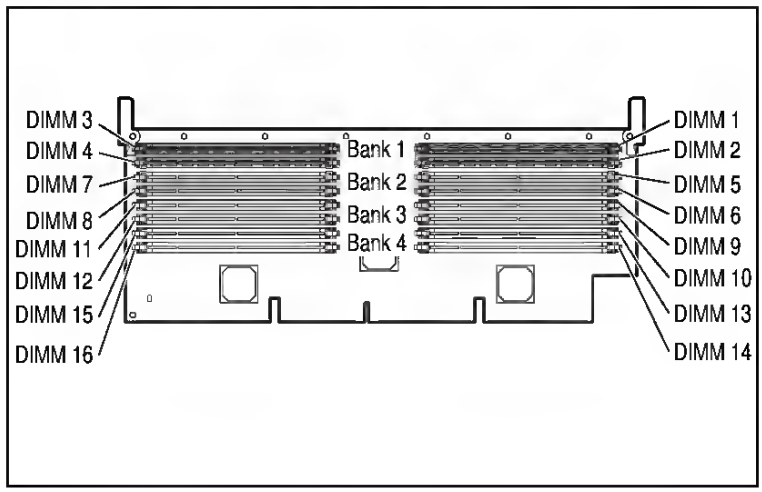

Figure 4-10. Memory banks on the memory board

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System Board Features

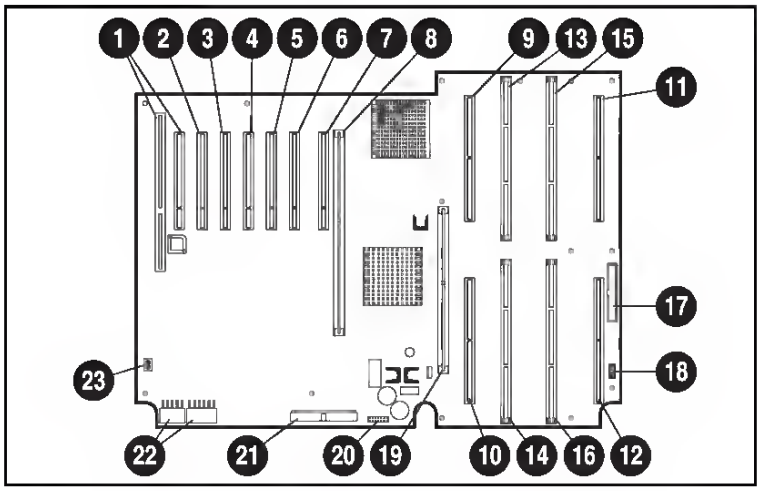

Figure 4-11. System board features

Table 4-1
System Board Features

Identifier	Description	Identifier	Description
❶	Shared PCI/ISA slots	⓲	Floppy power connector
❷-❺	Secondary PCI bus slots	⓳	Memory board connector
❻,❼	Primary PCI bus slots	⓴	Power supply signal connector
❽	Peripheral board connector	㉑	IDE connector
❾ - ⓬	Processor power module connectors	㉒	System board power connectors
⓭-⓰	Processor connectors	㉓	Core frequency switch
⓱	Floppy signal connector		

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System Board Switches

Your ProLiant 5500 server has been shipped with the core frequency switch properly set. However; you may consider changing the core frequency switch setting when upgrading to a faster processor.

CAUTION: Data integrity may be compromised when the core frequency settings below are set higher than the actual processor core frequency.

Table 4-2
Core Frequency Switch

Switch				Core Frequency
S1	S2	S3	S4	
ON	ON	OFF	ON	400 MHz
OFF	ON	OFF	ON	450 MHz
ON	ON	OFF	OFF	500 MHz

NOTE: The switch is open when in the OFF position and closed in the ON position.

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Peripheral Board Features

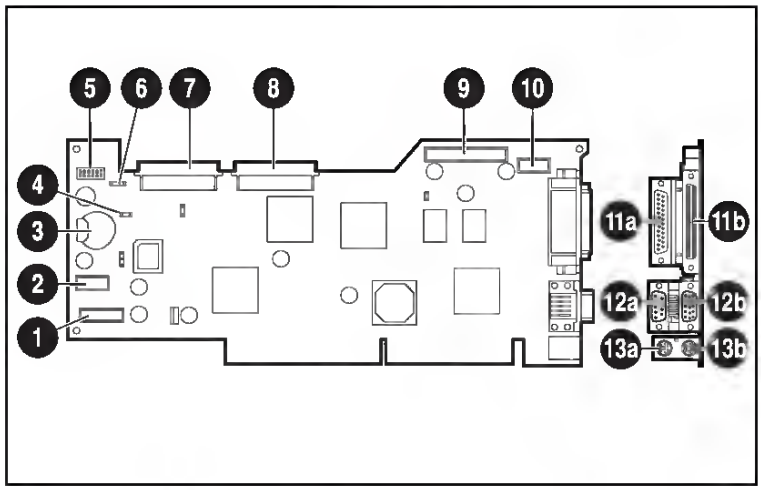

Figure 4-12. Peripheral Board Features

Table 4-3
Peripheral Board Features

Identifier	Description	Identifier	Description
1	Fan cable assembly connector	9	Integrated Management Display connector
2	Power switch connector	10	Serial B connector
3	Internal battery	11a	Parallel port connector
4	Internal battery jumper (use external battery, if removed)	11b	External SCSI connector
5	System configuration switch	12a	Serial A connector
6	External battery connector	12b	Video connector
7	SCSI Port 1 connector	13a	Keyboard connector
8	SCSI Port 2 connector	13b	Mouse connector

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Peripheral Board Switches

The following table defines the switch settings for the peripheral board. The Open (off) position is the default configuration for each switch.

Table 4-4
System Configuration Switch

	Switch	Open (Off) Position	Closed (On) Position
1.	Video	Enable integrated video	Disable integrated video
2.	Lock Contiguration	Configuration can be changed	Configuration can not be changed
3.	Rack Mount	System is tower configuration	System is rack mount configuration
4.	Diskette Override	Diskette boot is controlled by configuration	Diskette is enabled tor booting regardless of contiguration
5.	Password Enable	Power on password is enabled	Power on password is disabled
6.	Maintenance *	NV RAM is valid	NV RAM is invalidated, configuration is lost

NOTE: See the *ProLiant 5500 Service and Maintenance Guide* for information on the use ot this switch.

For use with Intel Pentium II Xeon processor-based servers only

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Interlock System

The Compaq ProLiant 5500 server interlock system prevents power distribution throughout the system if the memory board, processors, or peripheral board (including the power switch cable) are not fully installed or properly seated. The ProLiant 5500 server is not equipped with chassis interlocks; the board interlocks provided connect the memory board, processors, and peripheral board (including the power switch cable) in one interlock chain. When one of the connected components in the interlock chain is improperly seated in the connector, the LED associated with the fault origination point will illuminate. See Chapter 1 for details regarding the interlock error.

WARNING: Care must be exercised when the hood or side covers are removed because the system does not shut down automatically.

Accessing the Drive Cage Back Plane

These instructions cover the removal of the simplex drive cage and the installation of the Duplex drive cage. This procedure enables controller duplexing of the internal SCSI drives. Refer to the Chapter 7 for more information on configuring duplex and simplex modes.

1. Remove the side cover as shown in Figure 4-1.
2. Remove the fans and all cables to the fans.

CAUTION: Never power up the server if the fans have been removed from either the processor or I/O section. Overheating and damage to hardware could result.

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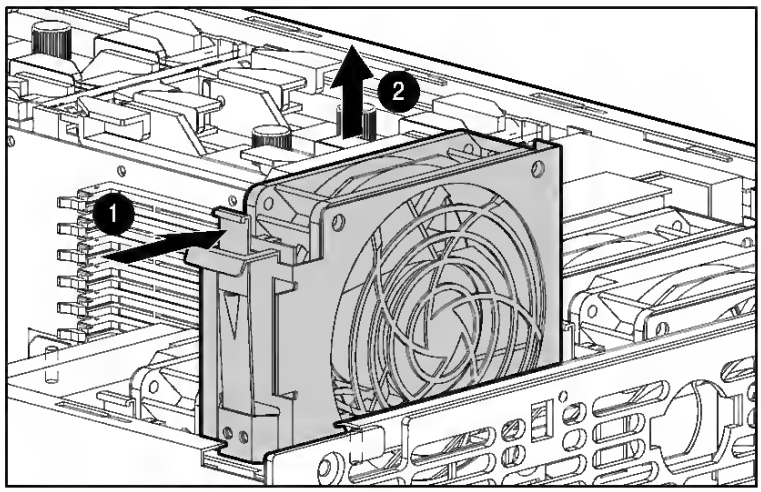

Figure 4-13. Removing a fan

3. Unlock the server, open the front panel, and slide the front panel up and away from the server.

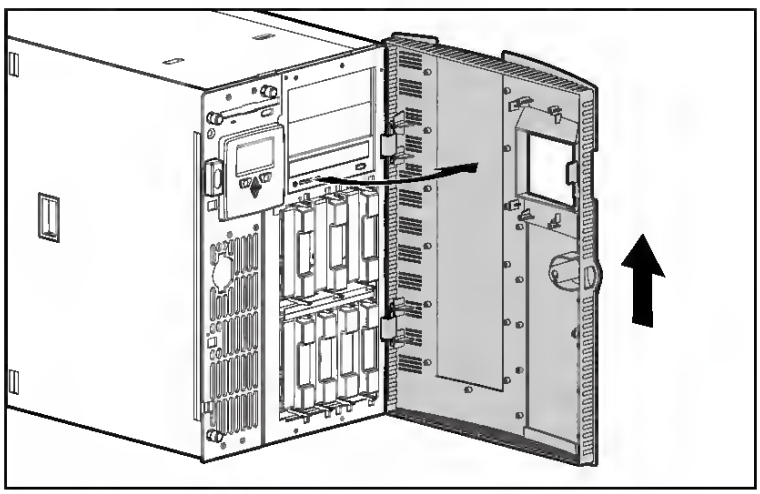

Figure 4-14. Removing front panel

4. Loosen the thumbscrews on the front of the drive cage.
5. Pull out the latch at the back of the drive cage (shown in Figure 4-16) and pull out the drive cage 2 to 3 inches to allow better access to cables.

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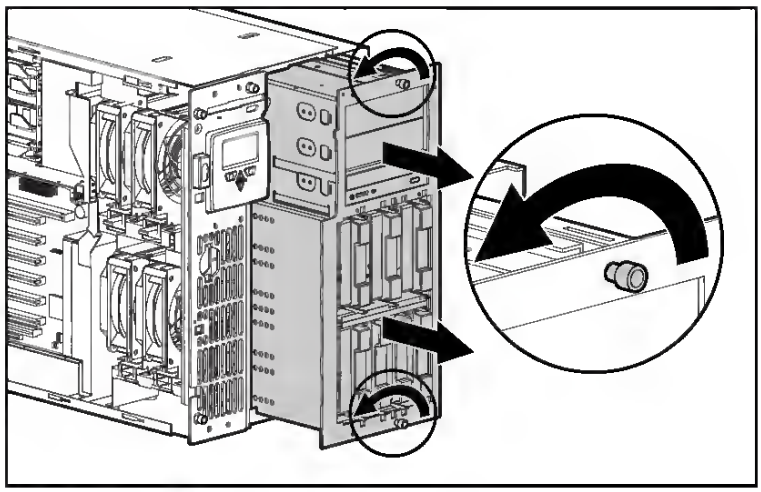

Figure 4-15. Partially pull out the drive cage

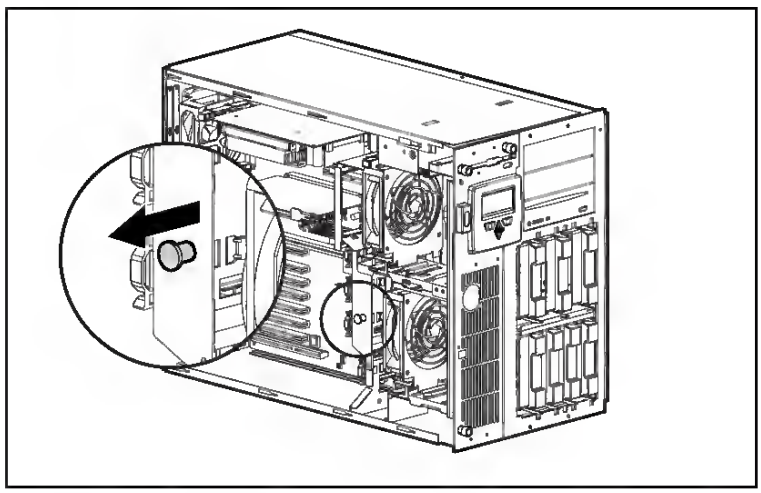

Figure 4-16. Drive cage latch

6. Remove all cables from the back of the drive cage except for the removable media power cable.

7. Completely remove the drive cage.

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Installing the Duplex Drive Cage Option

Be sure you have followed all the steps under "Accessing the Drive Cage Back Plane" before proceeding with the following steps.

1. Remove any components in the removable media bays and install them into the duplex drive cage.
2. Replace the drive cage. Do not push it back fully until after you install cables.

> **CAUTION:** The SCSI backplane board must have a Duplex Enabler board installed in order for the SCSI bus to be terminated properly. If this board is not installed, the service LEDs of all drives will light as a warning.

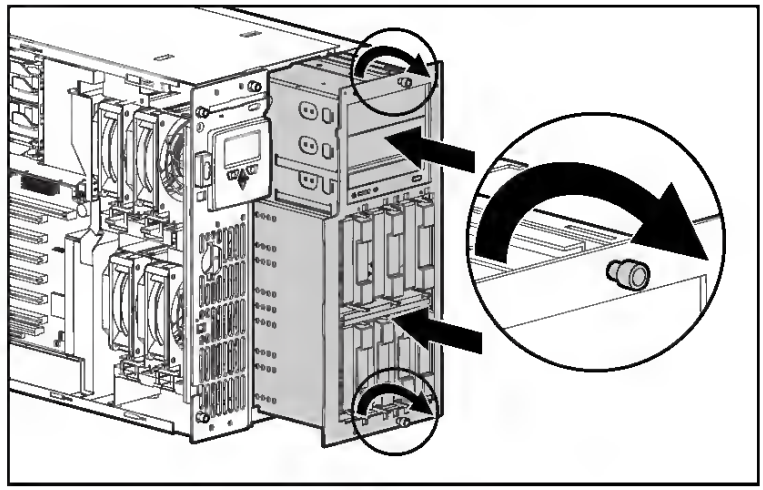

Figure 4-17. Installing the duplex drive cage

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3. Reconnect the SCSI cables on the back of the drive cage. Refer to Figure 4-18 for connector identification. See Chapter 7, "Cabling," for information on SCSI cabling.

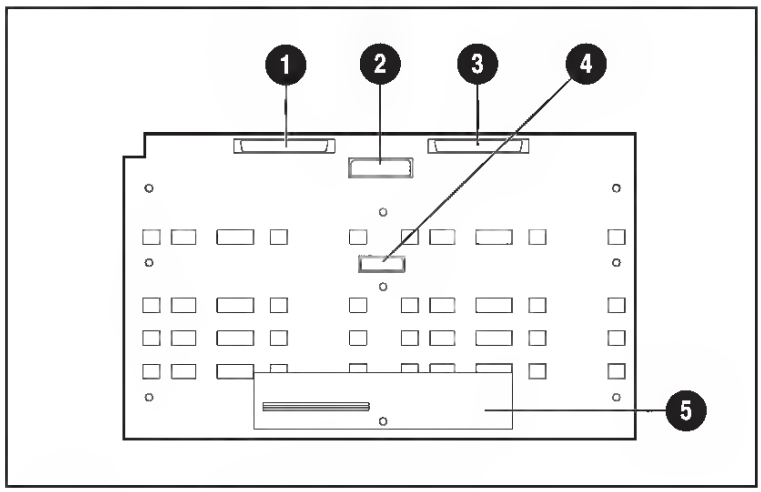

Figure 4-18. Connectors on back of drive cage

❶ SCSI input 1

❷ Duplex board power connector

❸ SCSI Input 0

❹ Removable media power connector

❺ Duplex enabler board

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4. Pull out the drive cage latch and push the drive cage back fully until the drive cage latch can be pushed into place.
5. Tighten the thumbscrews on the front of the drive cage.
6. Connect SCSI controller cables. See Chapter 7, "Cabling," for information on SCSI cabling. Figure 4-19 shows an example controller connection.

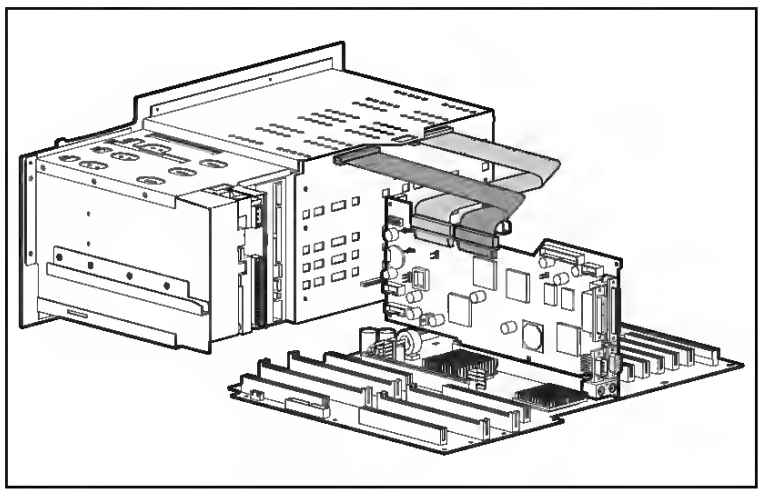

Figure 4-19. Example cable connection to SCSI controller

7. Replace fans.

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Accessing Hot-Plug Areas

This section describes how to access the hot plug SCSI drive area.

Components in these areas have color coded latches or levers to signify that they are hot-plug devices.

Accessing the Hot-Plug SCSI Drives

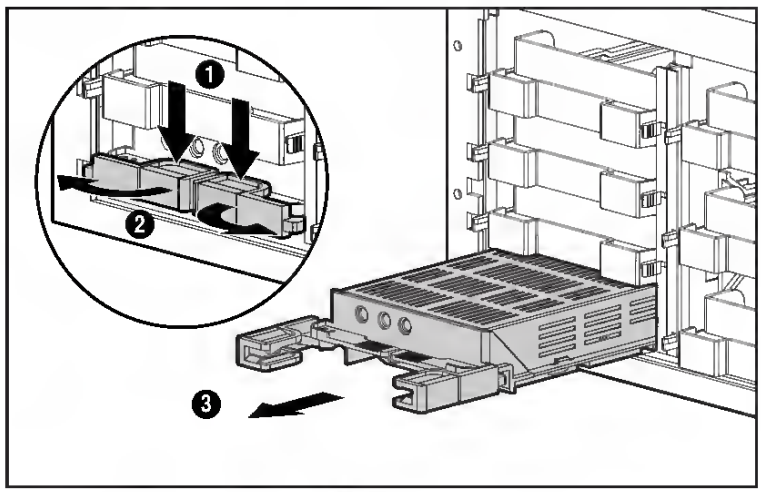

Figure 4-20. Removing a SCSI drive

NOTE: Pinch both sides of drive levers to unlock, then swing the levers out.

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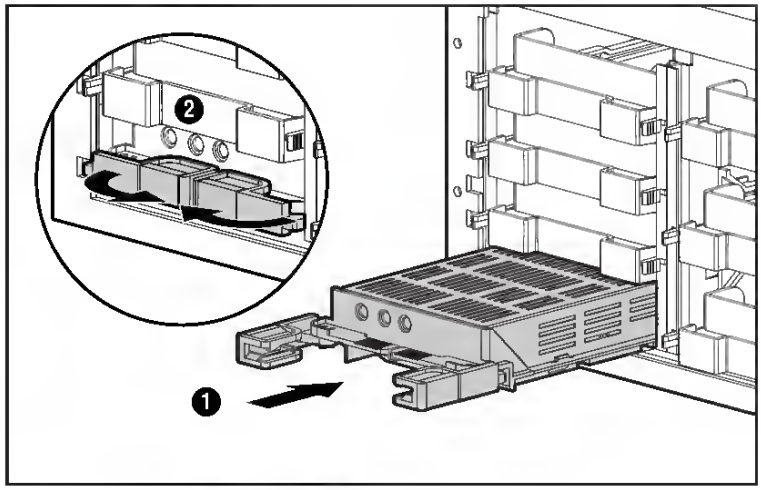

Figure 4-21. Installing a SCSI drive

SCSI ID Numbers

There are several possible numbering schemes depending on whether you are using 1-inch height drives, 1.6-inch height drives, or a simplex controller. The following figures illustrate the simplex mode scenarios.

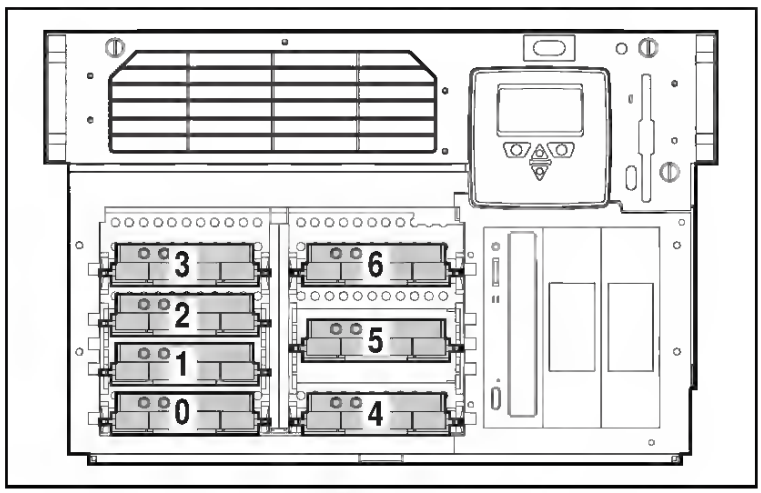

Figure 4-22. SCSI ID numbers - single SCSI channel (simplex mode) with 1-inch drives

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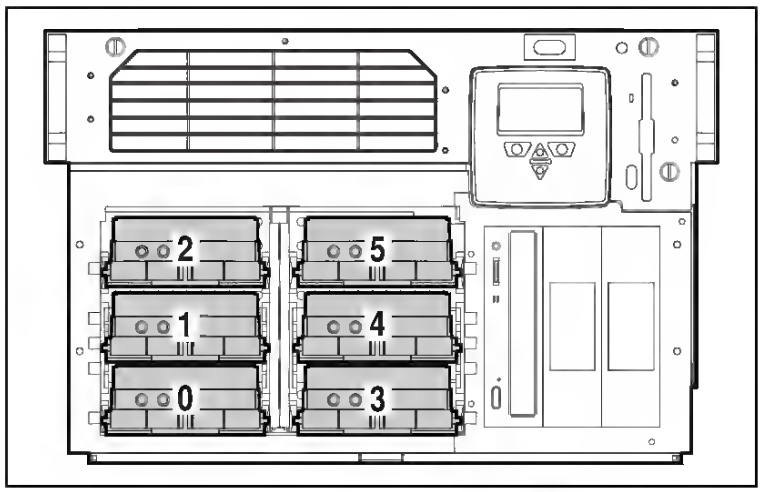

Figure 4-23. SCSI ID numbers - single SCSI channel (simplex mode) with 1.6-inch drives

Integrated Management Device

The Integrated Management Device (IMD) is standard on all ProLiant 5500 rack-mountable models. The IMD may be purchased separately as an option for tower models of this server.

See Chapter 6, "Integrated Management Display," for information on installing the IMD in tower models.

Power Supply Locks

The ProLiant 5500 server chassis will support a padlock to lock the server's power supplies. This option is purchased separately by ordering the option kit part number 296956-002.

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Chapter 5
Server Configuration and Utilities

Using Compaq SmartStart

SmartStart is the intelligent way to configure the server and to load the system software, thereby achieving a well-integrated server to ensure maximum dependability and supportability. To use the SmartStart and Support Software CD, refer to the Server Setup and Management pack. The first time the server is configured, the SmartStart program automatically creates a system partition and installs the Compaq System Configuration Utility and other Compaq utilities in that partition.

> **NOTE:** Until you run the System Configuration program, an information message indicating that you are running with a default configuration will occur each time you boot the system.

To install the SmartStart and Support Software CD:

1. With your computer turned on, locate the CD-ROM drive.
2. Open the CD-ROM tray by pressing the load/unload button.

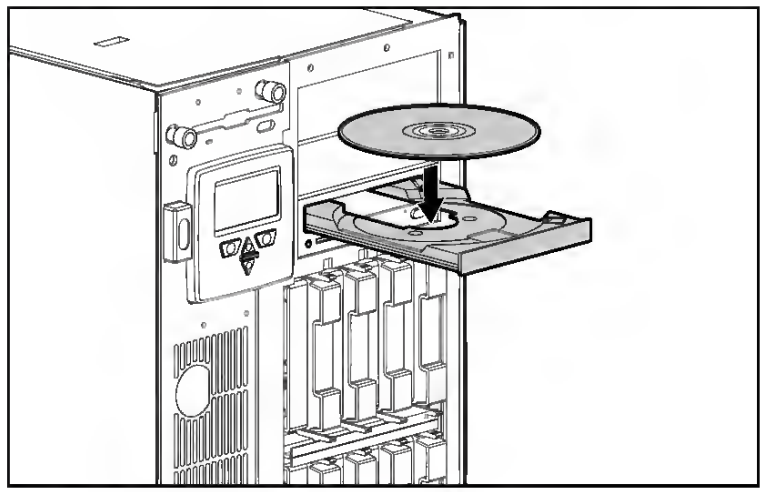

Figure 5-1. Installing a CD in the CD-ROM drive

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3. Place the SmartStart and Support Software CD in the tray (label facing up), handling the CD from the edges, not by the flat surfaces of the disc.
4. Close the tray by again pressing the load/unload button.

Upon closing the CD tray, the SmartStart installation sequence will begin automatically.

To configure the system and load the operating system, refer to the SmartStart documentation provided in the Server Setup and Management pack shipped with your server.

To manage the system, refer to the Compaq Management CD provided in the Server Setup and Management pack shipped with your server.

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Compaq System Configuration Utility

The Compaq System Configuration utility performs a wide range of configuration activities including the following:

- Configures ISA and PCI boards automatically
- Provides switch and jumper settings
- Resolves resource conflicts in areas such as memory, port addresses, and interrupts (IRQs)
- Manages the installation of memory, processor upgrades, and mass storage devices such as hard drives, tape drives, and diskette drives
- Sets and stores power-on features such as date and time
- Stores configuration information in non-volatile memory
- Assists in the installation of the operating system
- Assists in running diagnostic tools such as TEST and INSPECT Utilities

Installing an Operating System

Compaq ProLiant 5500 servers support the following operating systems:

- Novell NetWare 4.11 and IntranetWare
- Microsoft Windows NT 3.51 and 4.0
- SCO OpenServer 5.04 and 5.05
- SCO UnixWare 2.12 and 2.13
- IBM OS/2 2.x, Warp family of products
- Banyan VINES v 6.00 and above, including VINES 7.00

When you select the Operating System Installation feature from the System Configuration Utility main menu, the utility provides prompts to simplify the installation.

First, the utility prompts you to select the correct operating system. Use the arrow keys to select the operating system and press the **Enter** key. The utility then prompts you for the operating system CD or diskette.

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Not all operating systems ship with each server. Consult your local reseller or Compaq Customer Service to get a SmartStart pack with additional operating system support. Some operating systems have driver support/updates but not an integrated SmartStart installation. You can still configure your server and manually install your operating system.

SMP Operating System Support

Compaq provides optimized software support for the Dual Processing Boards for:

- Microsoft Windows NT 3.51 and 4.0
- NetWare 4.11 SMP and IntranetWare SMP
- SCO OpenServer 5.04 and 5.05
- UnixWare 2.12 and 2.13
- LAN Server 4.0 SMP

Loading Compaq Device Drivers

Drivers are located on the Support Software Diskette and on the Compaq SmartStart CD. The drivers on the Support Software Diskette may be newer versions with new functionality and upgraded utilities.

IMPORTANT: Always check *README* files on SmartStart or any Software Support Diskettes or CDs. If present, these files may contain information about important software updates.

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Diagnostics and Other Utilities

- When you select the Diagnostics and Utilities feature from the System Configuration Utility main menu, the utility provides prompts to test, inspect, upgrade, and diagnose the server.
- Diagnostics and Utilities are located on the system partition on the hard drive and must be accessed when a system configuration error is detected during the Power-On Self-Test (POST).
- Run the Inspect Utility once the computer has been configured to get information about the operating system environment.

For instructions on using the Diagnostics Utility and other Compaq utilities, refer to the Compaq Systems Reference Library CD.

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Chapter 6
Integrated Management Display

The Integrated Display (IMD) is an integrated LCD display panel mounted on the front of the server. It is designed for customers requiring even greater levels of uptime and improved serviceability. The LCD panel will display information directly at the server to assist the user in diagnosing and servicing the server without using a keyboard and monitor.

Integrated Management Display Features

The features of the Integrated Management Display include:

- **Flexibility** - The Integrated Management Display rotates to support both tower and rack configurations.
- **Manageability** - In an environment where every second counts, it is important to have service and administrative information at your fingertips. Typical information includes:
  - POST (Power-ON Self-Test) messages
  - User-defined administrative information
  - POST error events
  - System information
- **Ease of Use** - For enhanced server management, the Integrated Management Display provides a 16x4 character display and four button control panel to easily navigate through menus.

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Installing the IMD in the Tower Model

The Integrated Management Display (IMD) feature is standard in rack-mountable models of the Compaq ProLiant servers; this feature is optional in tower models. The following information explains how to install the IMD in the tower model.

1. Prepare the server for installation. See section "Preparing the Server" located in Chapter 4.
2. Remove the IMD blank.

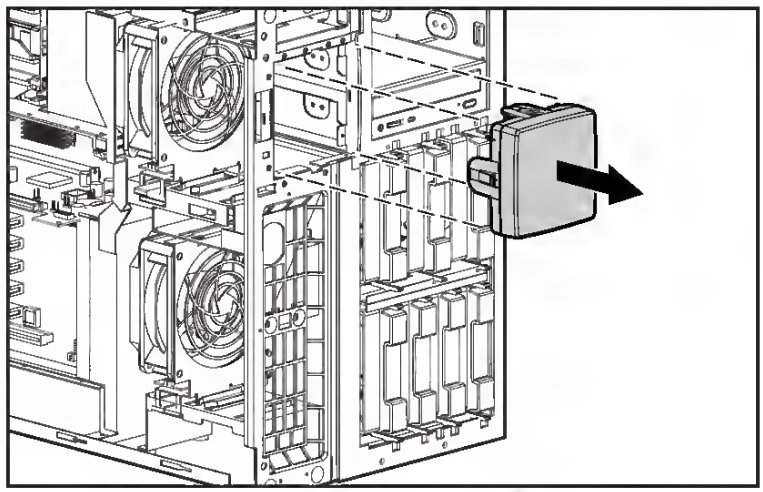

Figure 6-1. Removing the Integrated Management Display blank

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3. Install the Integrated Management Display.

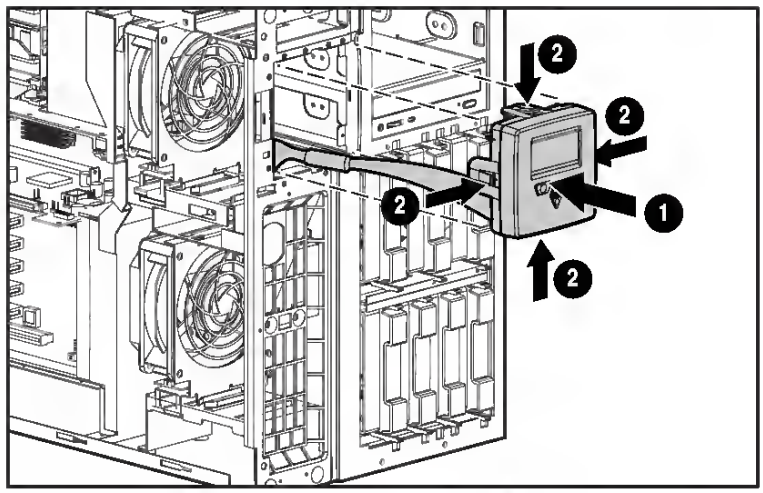

Figure 6-2. Installing the Integrated Management Display

4. Connect Integrated Management Display cable to the peripheral board.

5. Restore server to normal operation.

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Configuring the Integrated Management Display

The Compaq Integrated Management Display can be configured to display a variety of menus that can be customized to meet each user's specific needs. The following information explains how to configure and customize the Integrated Display.

Setup with the System Configuration Utility

After installing the hardware, configure the Integrated Managment Display using the System Configuration Utility located on the Compaq SmartStart and Support Software CD. It is recommended that this version of System Configuration be used because it is the latest one that supports the new Integrated Management Display. To run the utility:

1. Boot the computer from the Compaq SmartStart and Support Software CD.
2. From the Compaq System Utilities screen select Run System Configuration Utility.
3. Select Continue.
4. Select Review or modify hardware settings and press **Enter**.
5. Select Step 3: View or Edit Details and press **Enter.**
6. Scroll down until you find the section entitled Embedded Compaq LCD Module.
7. Highlight the field to be modified. Press **Enter** to edit the highlighted item, then type the text for that field. After entering the text, press **Enter** to accept the modifications. Each field is discussed in detail later in this chapter. See "Customizing Management Display Fields."
8. Repeat step 7 for each menu item to be modified.
9. Press **F10** to exit the View or Edit Details screen.
10. Select Step 5: Save and Exit.

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11. At the server prompt *Save the Configuration and Restart the Computer*, select **OK=Enter**. The changes that have been entered will not be displayed on the Display Panel until the computer is rebooted. Standard Integrated Management Display fields are defined later in this chapter.

12. In older versions of the System Configuration Utility installed on some hard drives, the user will be asked to upgrade its system partition. The System Configuration Utility should be upgraded at this time.

Customizing the Integrated Management Display Fields

Many of the fields shown on the Integrated Management Display can be customized. The following sections define each of the menu choices and include examples of some fields.

Idle Screen Text

After the display has been idle for five minutes, the Integrated Management Display shows the following default screen text:

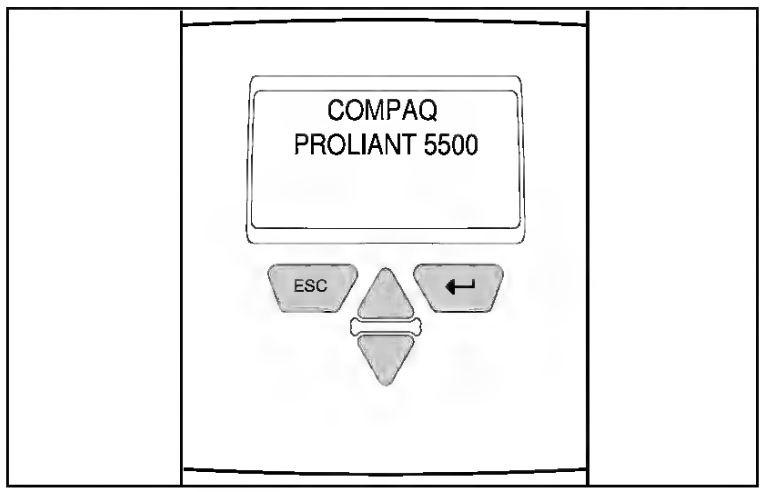

Figure 6-3. Idle Screen text

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This text can be changed by entering up to 3 lines with no more than 16 characters on each line. One suggestion would be to enter the server name here. This would allow an administrator to walk into a room with multiple servers and immediately locate the desired server.

Another example might be to put the company name and slogan or goal, such as:

SMITH & ASSOC
OVER 1 BILLION
IN SALES 1997

Custom Menu Item

This is a user-defined field that can be utilized for customizing each server. This one-line field can hold up to 14 characters. If text is entered in this field, the text appears as another choice in the main menu.

Custom Menu Screen

This is a user-defined field that can be utilized for customizing each server. Up to 4 lines of 14 characters each line can be entered.

Server Information

Server Name

Enter up to 2 lines of no more than 14 characters each. An example might be to name the server by department, such as:

CUST SERVICE
WESTERN REGION

Primary Operating System

Enter the primary operating system of the server, for example, NT4.0. Enter up to 3 lines of 14 characters each line.

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Other

Enter any additional server information that might be helpful to know about the server. This field can hold up to 2 lines of 14 characters each. For example, the server serial number might be entered in this field.

Administrator Information

Name

This field contains the name of the system administrator. Enter up to 2 lines of no more than 14 characters each.

Phone Number

This field contains the phone number of the system administrator. Enter up to 2 lines of no more than 14 characters each.

Pager Number

This field contains the pager number of the system administrator. Enter up to 2 lines of no more than 14 characters each.

Other

This is a user-defined field. Enter any additional administrator information. An example might be listing an additional administrator that serves as a backup to the primary administrator. Enter up to 2 lines of no more than 14 characters each.

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Service Information

Name

This field contains the name of the service provider. Enter up to 2 lines of no more than 14 characters each.

Phone Number

This field contains the phone number of the service provider. Enter up to 2 lines of no more than 14 characters each.

Pager Number

This field contains the pager number of the service provider. Enter up to 2 lines of no more than 14 characters each.

Other

This is a user-defined field. Enter any additional service information. An example might be to enter service contract number. Enter up to 2 lines of no more than 14 characters each. For example, server history information could be entered, such as

HARD DRIVE
REPLACED 7-96

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Standard Display Fields

In addition to the user-defined fields customized during configuration, the Integrated Management Display provides the following standard fields:

Events

Selecting this menu choice enables the user to scroll through a list of all error events starting with the most recent event.

ROM Date

This is the month/date/year of the current server ROM.

Bootblock Date:

This is the month/date/year of the current server Bootblock.

Memory

This field shows the total memory of the server.

Processor Configuration

This field shows the processor speed and other details about the processor.

F1 Prompt

Selecting this menu choice enables the user to continue booting without a keyboard or monitor. This feature is useful for service and diagnostic purposes, allowing the boot up process to continue without attaching a monitor and keyboard and their respective cables.

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Contrast

The level of contrast can be adjusted on the Integrated Display by using the **UP** and **DOWN** arrows. Press the **UP** arrow to increase the contrast, and press the **DOWN** arrow to decrease the contrast.

Navigating the Menus

The Compaq Integrated Management Display is menu-driven and easy to use. Information to navigate and utilize the menus follows.

Normal Run-time Behavior

When powering up the server, the first IMD screen shows the model number and LCD firmware revision of the server's display.

Next, a series of server Power-On Self-Test (POST) operations is displayed. During POST, the display indicates the server test in progress by a spinning bar beside the menu item. When the test is finished, the IMD shows a check mark by the completed menu item. A check mark means that the test is complete, but does not necessarily mean the test was free from errors.

If an error occurs during POST, the server logs the error to the IMD under Unviewed Events and requires the user to view the error before proceeding to any other menu choices.

If there are no errors, the Idle Screen Text appears. Figure 6-3 shows the default screen but this screen could be different if the text changed during configuration.

Navigation Buttons

To navigate through the menus, use the four buttons shown in Figure 6-4. The UP and DOWN arrow keys (❷and ❸) allow the user to move through the menu screens and choose menu items. The right button (❹) acts as an Enter key and allows the server to travel down through the menus. The left button (❶) acts as an Escape key and allows travel back up the menu.

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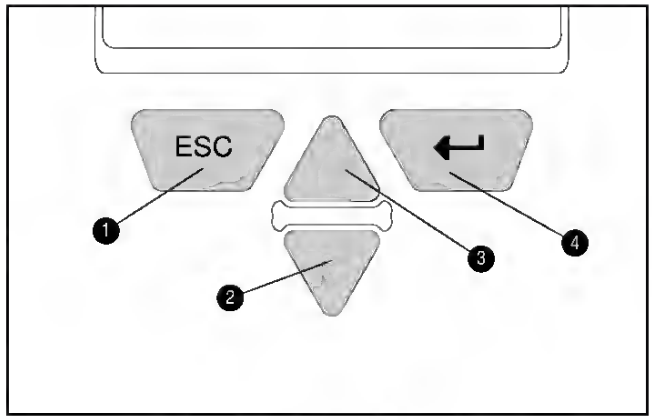

Figure 6-4. Integrated Management Display buttons

Display Symbols

There are three different display symbols used to indicate the options while scrolling through the menus. These symbols are the UP and DOWN arrows, and the Selector arrow.

Table 6-1
Integrated Management Display Symbols

Type of Symbol	Symbol	Meaning
Arrow	→	Selector arrow shows current menu item. Press **Enter** on the IMD to select the menu item to the right of this arrow.
Up Arrow	↑	If present in upper right corner, indicates previous information exists. Press the Up Arrow on the IMD to view the information. Press and hold the button to scroll.
Down Arrow	↓	If present in lower right corner, indicates more information exists. Press the Down Arrow on the IMD to view the information. Press and hold the button to scroll.

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System Behavior with Error Events

After system POST, if there is an F1 error condition the IMD flashes this message:

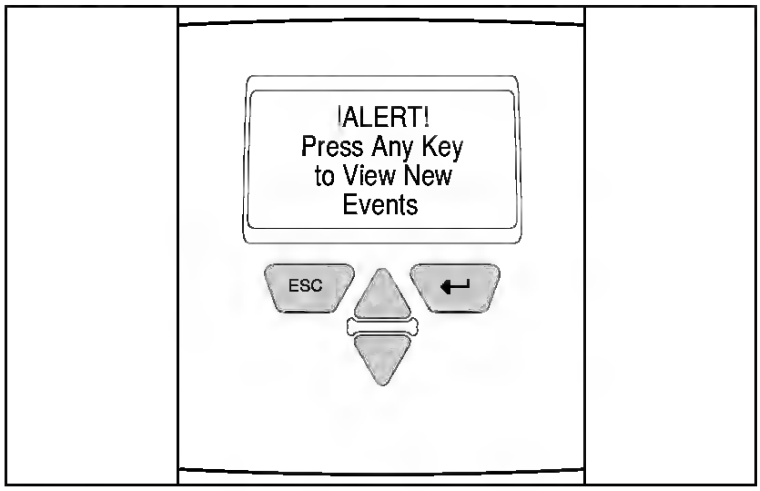

Figure 6-5. New event message

At this point it is necessary to scroll through each screen of the event information menu before the IMD will allow movement on to other menu choices. The display will not allow escape out of the Unviewed Events section until all of the information stored here has been examined.

For information on interpreting the event messages, see *the Integrated Management Log* shipped with the server.

After reviewing the events, proceed with normal display operation.

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Menu Structure

The following outline shows the structure of each menu and submenu in the order in which it appears:

Events

Event List

Administration Information

- Server
  - Server Name
  - Asset Tag
  - Operating System
  - Other
- Administrator
  - Name
  - Phone
  - Pager
  - Other
- Service
  - Name
  - Phone
  - Pager
  - Other
- Custom Menu Item (if entered)
  - Custom Menu Screen (if entered)

System Information

- ROM Date
- BootBlock Date
- Memory
- Processors

Contrast

- Contrast
- Other Information

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Integrated Management Log

The Compaq Integrated Management Log (IML) records system events and stores them in an easily-viewable form. The IML records hundreds of events instead of the 16 events that the Critical and Correctable Error Logs are capable of recording. The IML also marks each event with a time-stamp with one-minute granularity, instead of the one-hour granularity of the previous logs.

Events listed in the Integrated Management Log are categorized as one of four event severity levels:

- Status—indicates that the message is informational only.
- Repaired—indicates that corrective action has been taken.
- Caution—indicates a non-fatal error condition.
- Critical—indicates a component failure.

The Integrated Management Log requires Compaq Operating System-dependent drivers. Refer to Chapter 5, "Server Configuration and Utilities" for instructions on installing the appropriate drivers.

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Multiple Ways of Viewing the Log

You can view an event in the Integrated Management Log in several ways:

- On the Integrated Management Display
- From within Compaq Insight Manager
- From within Compaq Survey Utility
- Using the IML Management Utility, a DOS program located on the Compaq SmartStart and Support Software CD.

Compaq Insight Manager

Compaq Insight Manager is a server management tool providing in-depth fault, configuration and performance monitoring of hundreds of Compaq servers from a single management console. System parameters that are monitored describe the status of all key server components. By being able to view the events that may occur to these components, you can take immediate action. You can view and print the event list from within Insight Manager by following the instructions below. You can also mark a critical or caution event as repaired after the affected component has been replaced, for example, if a fan that has failed has been replaced. By marking it as repaired, you can lower the severity of the event.

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Viewing the Event List

1. From Compaq Insight Manager, select the appropriate server; then select View Device Data.

   The selected server is displayed with buttons around its perimeter.

2. Select the Recovery button.

3. Select Integrated Management Log.

   NOTE: You can only view the list from the Recovery/Integrated Management screen. To print the list, follow the instructions below.

4. If a failed component has been replaced, select the event from the list; then select Mark Repaired.

Printing the Event List

NOTE: You can only view the list from the Recovery/Integrated Management Log screen as described above. To print the list, follow the instructions below

1. From the Insight Manager, select the appropriate server.

   The selected server is displayed with buttons around its perimeter.

2. Select the Configuration button.

3. Select the Recovery button.

4. Select Print.

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Compaq Survey Utility

The Compaq Survey Utility is a serviceability tool available for Windows NT and Novell NetWare that delivers on-line configuration capture and comparison to maximize server availability. It is delivered on the Compaq Management CD in the Server Setup and Management package, or is available on the Compaq web site. Refer to the Compaq Management CD for information on installing and running the Survey Utility.

After you have run the Survey Utility, you can view the Integrated Management Log by loading the output of the utility (typically called "survey.txt") into a text viewer such as Notepad. The event list follows the system slot information. Once you have opened the text file, you can print it using the print feature of the viewer.

Compaq IML Management Utiltiy

The Compaq IML Management Utility is a DOS-based tool that gives you the off-line ability to review, mark corrected, and print events from the IML. It is located on the Compaq SmartStart and Support Software CD. Refer to the *SmartStart Installation for Servers* poster for information on how to install and use the IML Management Utility.

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List of Events

The event list displays the affected components and the associated error messages. Though the same basic information is displayed, the format of the list may be different depending on how you are viewing it: on the Integrated Management Display, from within Compaq Insight Manager, or from within the Compaq Survey Utility. An example of the format of an event as displayed on the Integrated Management Display is as follows:

001 of 010
---CAUTION---
03/19/1997
12:54 PM
FAN INSERTED
Main System
Location:
System Board
Fan ID: 03
END OF EVENT

Table 6-2 identifies the event types (affected components) and associated event messages.

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Table 6-2
Event Messages

Event Type	Event Message
Machine Environment	
Fan Failure	System Fan Failure (Fan X, Location)
Fan Inserted	System Fan Inserted (Fan X, Location)
Fan Removed	System Fan Removed (Fan X, Location)
Fans Not Redundant	System Fans Not Redundant
Overheat Condition	System Overheating (Zone X, Location)
Main Memory	
Correctable Error threshold exceeded	Corrected Memory Error threshold passed (Slot X, Memory Module X)
	Corrected Memory Error threshold passed (System Memory)
	Corrected Memory Error threshold passed (Memory Module unknown)
Uncorrectable Error	Uncorrectable Memory Error (Slot X, Memory Module X)
	Uncorrectable Memory Error (System Memory)
	Uncorrectable Memory Error (Module unknown)
Processor	
Correctable Error Threshold exceeded	Processor Correctable Error Threshold passed (Slot X, Socket X)
Uncorrectable Error	Processor Uncorrectable internal error (Slot X, Socket X)
Host Bus Error	Unrecoverable Host Bus Data Parity Error
	Unrecoverable Host Bus Address Parity Error

Continued

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Event Messages *Continued*

Event Type	Event Message
EISA Bus	EISA Expansion Bus Master Timeout (Slot X)
	EISA Expansion Bus Slave Timeout
	EISA Expansion Board Error (Slot X)
	EISA Expansion Bus Arbitration Error
PCI Bus Error	PCI Bus Error (Slot X, Bus X, Device X, Function X)
POST Error	POST Error: Error message
Power Subsystem	
Power Supply Failure	System Power Supply Failure (Power Supply X)
Power Supply Inserted	System Power Supply Inserted (Power Supply X)
Power Supply Removed	System Power Supply Removed (Power Supply X)
Power Supply Not Redundant	System Power Supplies Not Redundant
System Configuration Battery Low	Real-Time Clock Battery Failing
Power Module Failure	A CPU Power Module (System Board, Socket X)
	A CPU Power Module (Slot X, Socket X)
Power Modules Not Redundant	System Power Modules Not Redundant
AC Voltage Problem	System AC Power Problem (Power Supply X)
Power AC Overload	System AC Power Overload (Power Supply X)

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Event Messages *Continued*

Event Type	Event Message
Automatic Server Recovery	
ASR Reset Detected	ASR Lockup Detected: Cause
System Lockup	
ASR Reset Limit Detected	
Operating System	
System Crash	Blue Screen Trap: Cause [NT]
	Kernel Panic: Cause [UNIX]
	Abnormal Program Termination: Cause [NetWare]
Automatic OS Shutdown	Automatic Operating System Shutdown Initiated Due to Fan Failure
	Automatic Operating System Shutdown Initiated Due to Overheat Condition
	Fatal Exception (Number X, Cause)

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Error Code Messages

Table 6-3
Error Code Messages

Error Message	Probable Cause	Recommended Solution
LCD Error 01	Indicates a RAM test error	Contact Authorized Compaq Service Representative
LCD Error 02	Indicates a data bus error	Check the cable connection
LCD Error 03	Indicates a data bus error	Check the cable connection

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Chapter 7
Cabling

ProLiant 5500 Cables and Connectors

The following information provides the user with a description of the ProLiant 5500 server cables, drive cage option cables and SCSI connectors. Information is included for cabling the simplex drive cage and the optional duplex drive cage. Additionally, reference information is presented for connecting serial ports, parallel ports, mouse, monitor, and keyboard.

ProLiant 5500 Cables Shipped with Server

The ProLiant 5500 server is shipped with the following items:

- One 19-inch, point-to-point non-terminated SCSI cable (part number 199606-007)
- One 22-inch, 3-device cable terminated SCSI cable to removable media bays (part number 199616-010)
- One 18-inch IDE cable (part number 243026-004)

ProLiant 5500 Server Cable Kit Contents

The ProLiant 5500 server cable kit (part number 306585-B21) contains the following items:

- One internal 19-inch, point-to-point non-terminated SCSI cable (part number 199606-007)
- One internal 32-inch, 3-device terminated SCSI cable to removable media bays (part number 199616-012)
- One 8.75-inch, external loopback SCSI cable (part number 189646-005)

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SCSI Cable Connectors

To help identify the SCSI cables required for ProLiant 5500 server installation, refer to the following illustrations. Keep in mind these characteristics:

- All Compaq ProLiant 5500 SCSI connectors are Wide-Ultra 68-pin connectors.
- External SCSI cables have a round wire with securable connectors.
- Internal SCSI cables have a flat ribbon wire with push-on connectors.
- Compaq SCSI cables are keyed so that they cannot be installed incorrectly.
- Fast-Wide SCSI-2 (wide SCSI) internal ribbon cables are physically smaller (narrower) than the Fast-SCSI-2 (standard SCSI) cables.

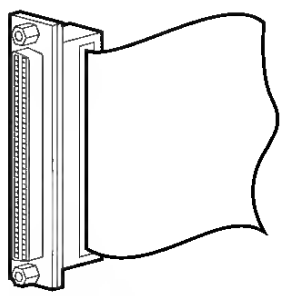

Figure 7-1. External/Internal Fast Wide SCSI-2 (Wide SCSI) 68-pin connector

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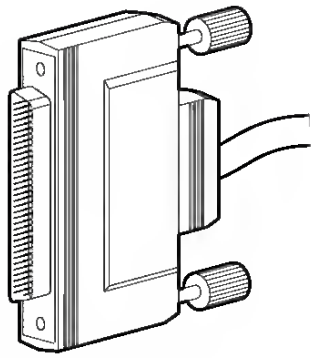
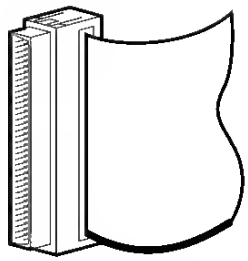
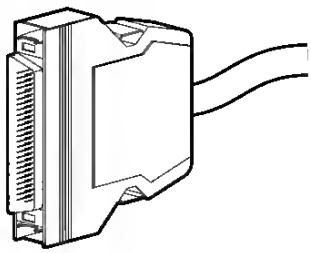


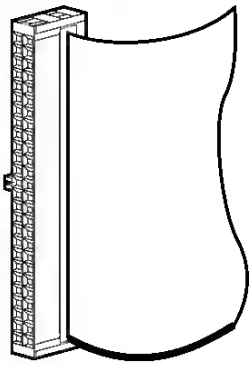
External Wide-Ultra SCSI/Fast-Wide SCSI-3
(Wide SCSI) 68-Pin



Internal Wide-Ultra SCSI/ast-Wide SCSI-3
(Wide SCSI) 68-Pin



External Fast-SCSI-2
(Standard SCSI) 50-Pin



Internal Fast-SCSI-2
(Standard SCSI) 50-Pin

Figure 7-2. SCSI connectors

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External Cabling

The following figure shows the locations of the external connectors on the back of the server.

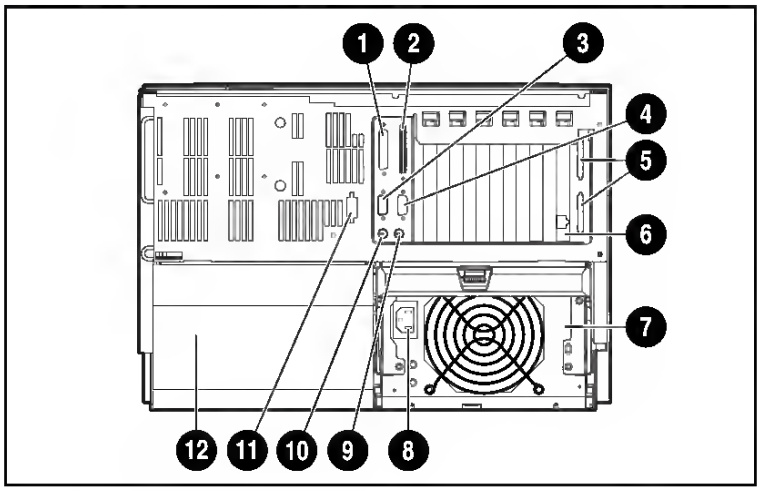

Figure 7-3. External connectors

❶	Parallel port connector	❼	Hot-plug power supply
❷	External SCSI connector	❽	Power supply outlet
❸	Serial A connector	❾	Mouse connector
❹	Video connector	❿	Keyboard connector
❺	SCSI knockouts	⓫	Serial B connector
❻	NIC (RJ-45 connector)	⓬	Redundant power supply bay

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Determining Cabling Needs

To determine the SCSI cables needed for your application, follow the procedure below:

1. Determine whether the cabling needs are internal or external.
2. Determine whether external cabling needs are for primary storage (hard drive) or for secondary storage (tape drive or CD-ROM in the removable media bay).
3. Identify the controller type.
4. Identify the drive type, drive cage, and expansion slot to be used.
   - ❑ Wide-Ultra SCSI-3 Hard Drive
   - ❑ Fast-Wide SCSI-2 Hard Drive
   - ❑ Fast SCSI-2 Hard Drive
   - ❑ Tape Drive
   - ❑ SCSI CD-ROM
5. Refer to the appropriate entry in the SCSI Cable Usage Matrix in this chapter to determine the correct usage and routing of the cables for your configuration.

   NOTE: Only those controllers listed in the SCSI Cable Usage Matrix are supported by Compaq ProLiant 5500 servers.

For the latest information on SCSI controllers and configurations supported on the Compaq ProLiant 5500 server, see the following URL: www.compaq.com.

IDE Controller

Compaq ProLiant 5500 servers ship standard with CD-ROM drives in the removable media bay. Figure 7-4 shows the connection for the CD-ROM signal cable and power cable.

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Integrated SCSI Controller

The Compaq ProLiant 5500 server has a Dual Channel Integrated Wide-Ultra SCSI-3 controller integrated into the peripheral board. The two outputs from this controller are designated SCSI Port 1 and SCSI Port 2 as shown in the following figure.

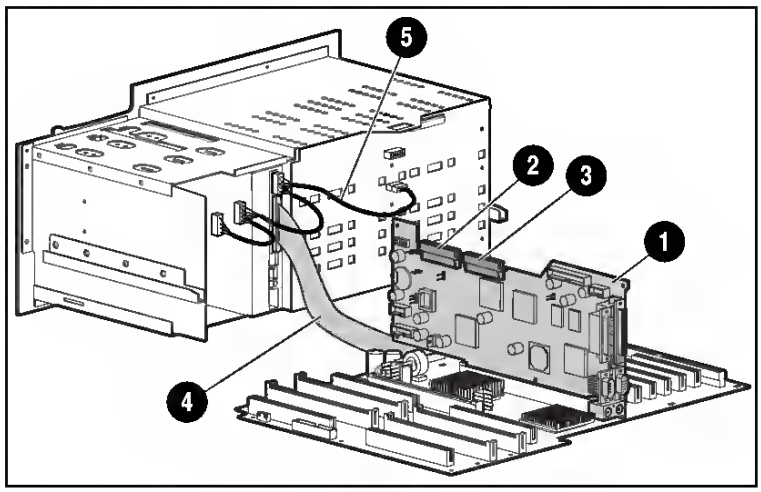

Figure 7-4. Integrated SCSI controller outputs

❶ Peripheral board

❷ SCSI Port 1

❸ SCSI Port 2

❹ IDE signal cable

❺ IDE power cable

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Standard SCSI Simplex Configuration

Compaq ProLiant 5500 servers are shipped standard in the simplex mode, which connects all drives from the hard drive backplane board (simplex board) to SCSI Port 1 on the peripheral board.

Simplex Board Connectors

In the Compaq ProLiant 5500 server, the simplex board has one SCSI input channel, designated SCSI Input 0. This connector is shown in Figure 7-5.

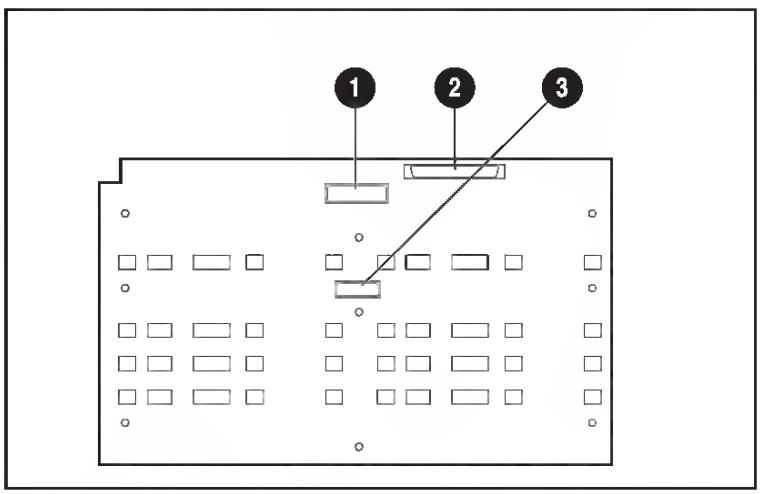

Figure 7-5. Simplex board connectors

❶ Simplex board power connector

❷ SCSI Input 0

❸ Removable media power connector

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SCSI Input 0 Channel

The SCSI Input 0 channel connects to SCSI hard drive slots 0 through 6, as shown in Figure 7-6.

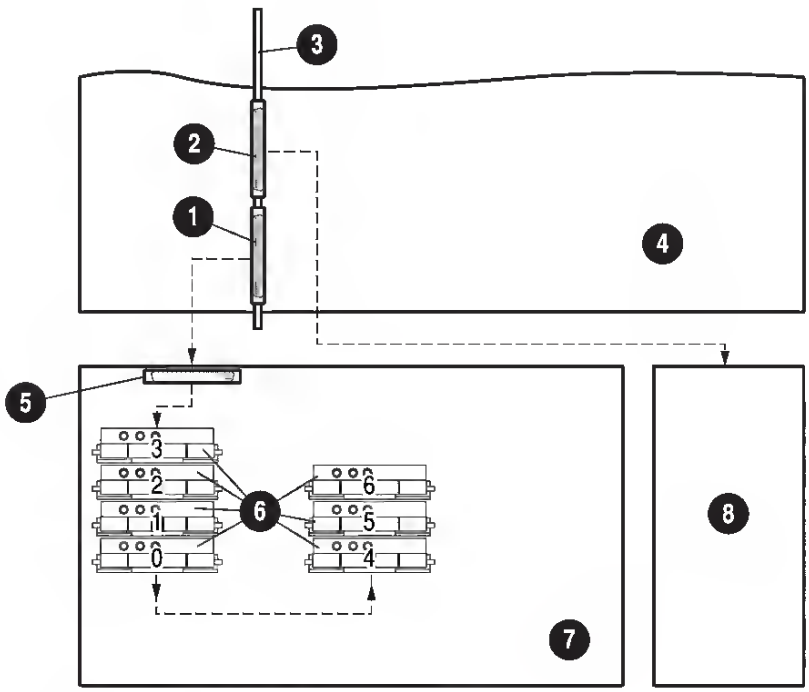

Figure 7-6. SCSI input 0 channel

❶ SCSI Port 1

❷ SCSI Port 2

❸ Peripheral board

❹ System board

❺ SCSI Input 0

❻ SCSI hard drives

❼ Simplex board

❽ Removable media bay

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Table 7-1
SCSI Cable Usage Matrix for Simplex Mode

Controller	Hot-Plug SCSI Hard Drives in Internal Drive Cage	2/4 DAT Drive 4/8 DAT Drive Internal TurboDAT Autoloader 8X SCSI CD-ROM 4/16 TurboDAT 15/30 DLT Drive	35/70 DLT Drive
Integrated SCSI-Port 1 Controller	Shipping configuration: ■ A 19-inch point-to-point non-terminated SCSI cable (199606-007) is connected from SCSI Port 1 to SCSI Input 0 of Simplex board.	In Simplex mode, the recommended use for SCSI Port 1 is for the hard drives. If SCSI Port 2 is unavailable for removable media bay devices: ■ Connect 22-inch 3-device terminated SCSI cable (199616-010) from SCSI Port 1 to the removable media bay devices. ■ Use 50 to 68 pin adapter (199618-001) if needed. ■ See note 1.	In Simplex mode, the recommended use for SCSI Port 1 is for the hard drives. If SCSI Port 2 is unavailable for removable media bay devices: ■ Connect 22-inch 3-device terminated SCSI cable (199616-010) from SCSI Port 1 to the removable media bay devices.

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SCSI Cable Usage Matrix for Simplex Mode *Continued*

Controller	Hot-Plug SCSI Hard Drives in Internal Drive Cage	2/4 DAT Drive 4/8 DAT Drive Internal TurboDAT Autoloader 8X SCSI CD-ROM 4/16 TurboDAT 15/30 DLT Drive	35/70 DLT Drive
Integrated SCSI-Port 2 Controller See Note 2.	In Simplex mode, the recommended use for SCSI PORT 2 is for the removable media bay devices. If SCSI PORT 1 is unavailable for the hard drives: ■ Connect 19-inch point-to-point non-terminated SCSI cable (199606-007) from SCSI Port 2 to SCSI Input 0 of Simplex board.	■ Connect the 22-inch 3-device terminated SCSI cable (199616-010) from SCSI Port 2 to the removable media bay devices. ■ Use 50 to 68 pin adapter (199618-001) if needed. ■ See note 1.	■ Connect the 22-inch 3-device terminated SCSI cable (199616-010) from SCSI Port 2 to the removable media bay devices.

Continued

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SCSI Cable Usage Matrix for Simplex Mode *Continued*

Controller	Hot-Plug SCSI Hard Drives in Internal Drive Cage	2/4 DAT Drive 4/8 DAT Drive Internal TurboDAT Autoloader 8X SCSI CD-ROM 4/16 TurboDAT 15/30 DLT Drive	35/70 DLT Drive
32 Bit Fast-Wide SCSI-2 Controller/P and Wide-Ultra Controller/P	■ Use cable option kit, part number 306585-B21. ■ Connect 19-inch point - to - point non-terminated cable (199606-007) from optional controller board to SCSI Input 0 ot Simplex board.	■ Use cable option kit, part number 306585-B21. ■ Connect 32-inch 3-device terminated SCSI cable (199616-012) from optional controller board to removable media bay devices. ■ Use 50 to 68 pin adapter (199618-001),if needed. ■ See note 1.	■ Use cable option kit, part number 306585-B21. ■ Connect 32-inch 3-device terminated SCSI cable (199616-012) from optional controller board to removable media bay devices.
Smart-2 Array Controller /P, /SL, /DH and Smart Array 3200 Controller	■ Use Cable option kit, part number 306585-B21. ■ Connect 19-inch point-to-point non-terminated SCSI cable (199606-007) trom optional controller board to SCSI Input 0 ot Simplex board.	Tape Drives and CD-ROMs are *not supported* using a SMART-2 Array Controller.	Tape Drives and CD-ROMs are *not supported* using a SMART-2 Array Controller.

Note 1: It additional 50 to 68 pin adapters are needed order Kit #212055-001.

Note 2: The SCSI Port 2 Controller is connected to the SCSI Port 2 connector and external SCSI connector. It is recommended that you use SCSI Port 2 controller for either internal or external drives, not both.

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Examples

This section contains example cabling scenarios covering the most common applications. If your planned configuration does not match one of these examples, use the SCSI Cable Matrices in Tables 7-1 and 7-2 and these examples as a general guide.

Example 1: Standard Configuration - Using Integrated SCSI Port 1 for Hard Drives, SCSI Port 2 for Removable Media Bay

The Compaq ProLiant 5500 server ships standard in the simplex mode, as shown in Figures 7-7 and 7-8. This configuration uses the integrated SCSI controller to handle all seven SCSI drive slots. SCSI Port 2 can be connected to the removable bay devices.

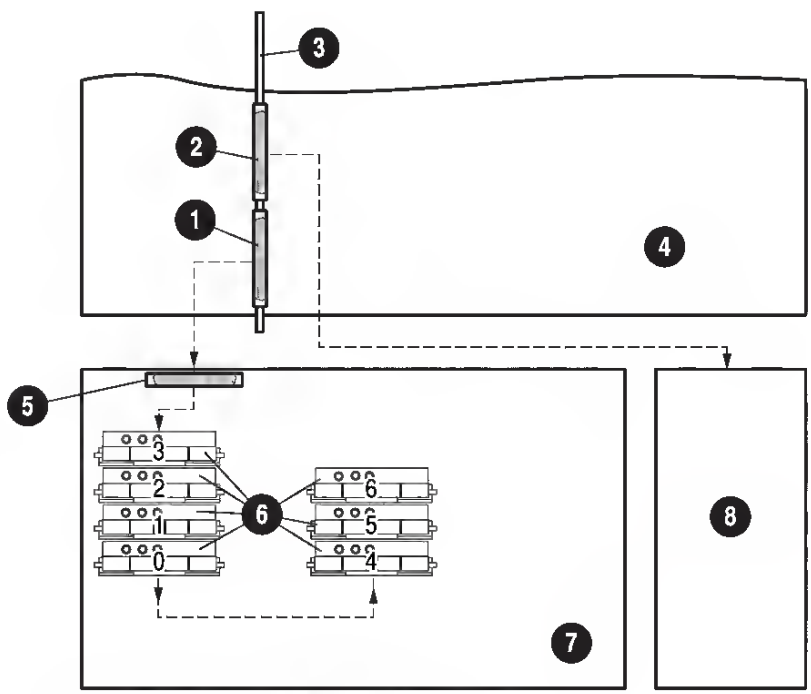

Figure 7-7. Example 1: Configuration diagram

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❶ SCSI Port 1

❷ SCSI Port 2

❸ Peripheral board

❹ System board

❺ SCSI Input 0

❻ SCSI hard drives

❼ Simplex board

❽ Removable media bay

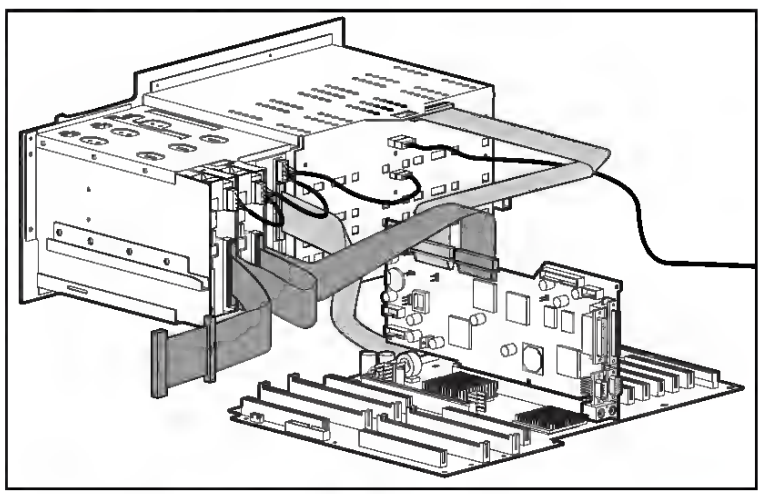

Figure 7-8. Example 1: Connection diagram

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Example 2: Using One Optional SMART-2 Controller for Hard Drives, Integrated SCSI Port 1 for Removable Media Bay

1. Remove the installed SCSI cable (199606-007) from Integrated SCSI Port 1 and SCSI Input 0 of simplex board.
2. Install the 19-inch point-to-point non-terminated SCSI cable (199606-007) supplied with the cable option kit (306585-B21) from the optional SCSI board connector to the SCSI Input 0 connector of the simplex board.

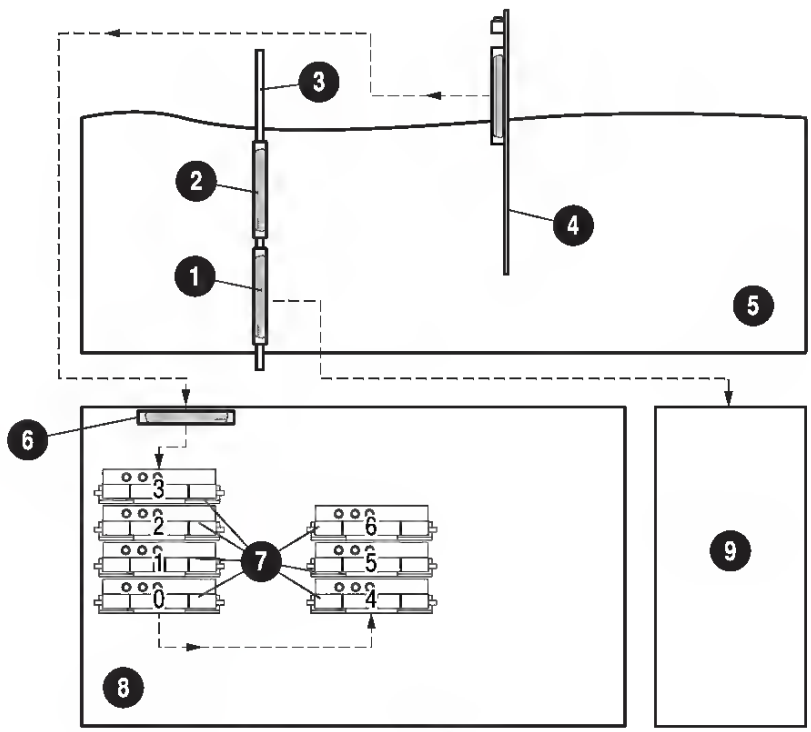

Figure 7-9. Example 2: Configuration diagram

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❶ SCSI Port 1

❷ SCSI Port 2

❸ Peripheral board

❹ Optional SCSI board

❺ System board

❻ SCSI Input 0

❼ SCSI hard drives

❽ Simplex board

❾ Removable media bay

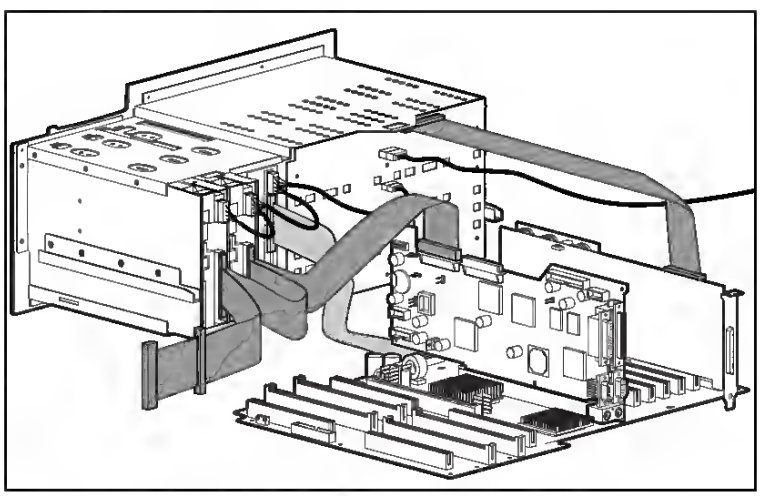

Figure 7-10. Example 2 Connection diagram

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Optional SCSI Duplex Configuration

Compaq ProLiant 5500 servers that are optionally configured in the duplex mode split the hard drive backplane board (duplex board) into two separate independent SCSI channels. Each channel supports either 4 X 1" or 3 X 1.6" drives.

Duplex SCSI Channels

In the Compaq ProLiant 5500 server, the duplex board has two SCSI input channels, designated SCSI Input 0 and SCSI Input 1. These connectors are shown in Figure 7-11.

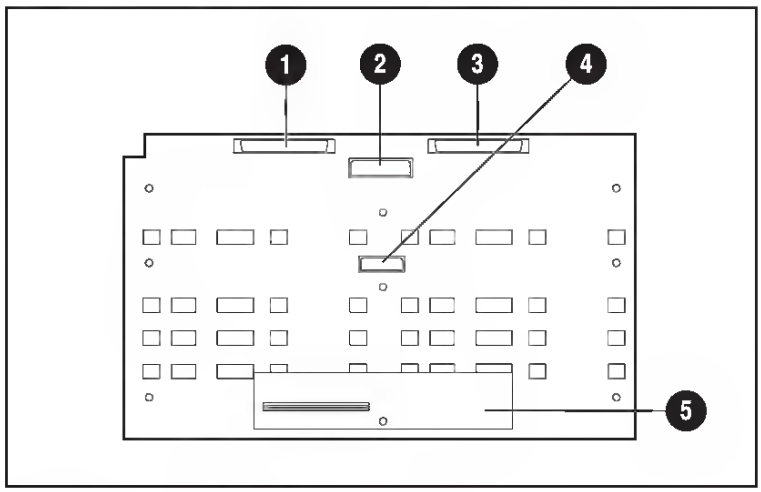

Figure 7-11. Duplex board connectors

❶ SCSI input 1

❷ Duplex board power connector

❸ SCSI Input 0

❹ Removable media power connector

❺ Duplex enabler board

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SCSI Input 0 Channel

The SCSI Input 0 channel connects to SCSI hard drive slots 0 through 3, as shown in Figure 7-12.

SCSI Input 1 Channel

The SCSI Input 1 channel connects to SCSI hard drive slots 4 through 7, as shown in Figure 7-12. In this case, slots 4 through 7 become SCSI IDs 0 through 3, respectively, on the SCSI Input 1 channel. The SCSI Input 1 channel can be routed to the removable media bay from the connector on the duplex enabler board. You can use this for connecting to SCSI devices in the removable media bay.

NOTE: When connecting from the duplex enabler board to SCSI devices in the removable media bay, you must set the SCSI IDs for the devices in the removable media bay to 4, 5, or 6.

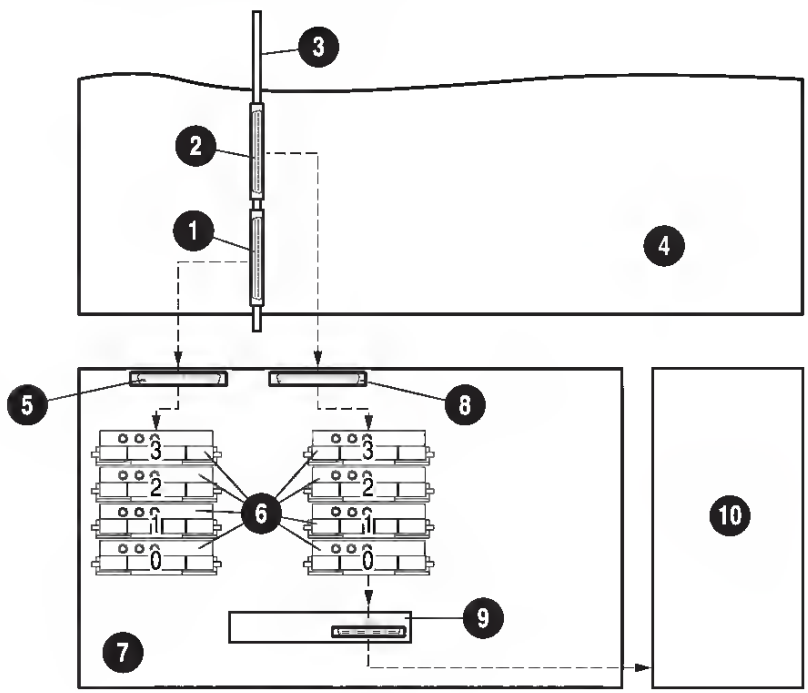

Figure 7-12. SCSI Input 0 and 1 channels

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❶ SCSI Port 1

❷ SCSI Port 2

❸ Peripheral board

❹ System board

❺ SCSI Input 0

❻ SCSI hard drives

❼ Duplex board

❽ SCSI Input 1

❾ Duplex enabler board

❿ Removable media bay

Table 7-2
SCSI Cable Usage Matrix for Duplex Mode
(Duplex enabler board installed on drive cage backplane)

Controller	Hot-Plug SCSI Hard Drives in Internal Drive Cage	2/4 DAT Drive 4/8 DAT Drive Internal TurboDAT Autoloader 8X SCSI CD-ROM 4/16 TurboDAT 15/30 DLT Drive	35/70 DLT Drive
Integrated Controller Port 1	■ Connect 19-inch point-to-point non-terminated SCSI cable (199606-007) from SCSI Port 1 to SCSI Input 0 of duplex board.	■ Connect 22-inch 3-device terminated SCSI (199616-010) from SCSI PORT 1 to the removable media bay devices. ■ Use 50 to 68 pin adapter (199618-001) if needed ■ See Note 2	■ Connect 22-inch 3-device terminated SCSI cable (199606-010) from SCSI PORT 1 to the removable media bay devices.

Continued

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SCSI Cable Usage Matrix for Duplex Mode *Continued*

Controller	Hot-Plug SCSI Hard Drives in Internal Drive Cage	2/4 DAT Drive 4/8 DAT Drive Internal TurboDAT Autoloader 8X SCSI CD-ROM 4/16 TurboDAT 15/30 DLT Drive	35/70 DLT Drive
Integrated Controller Port 2 See Note 5.	■ Connect 19-inch point-to-point non-terminated SCSI cable (199606-007) from SCSI Port 2 to SCSI Input 1 of duplex board.	■ Connect 22-inch 3-device terminated SCSI (199616-010) from duplex enabler board to the removable media bay devices. ■ Use 50-to-68 pin adapter (199618-001) if needed. ■ See Note 2.	■ Connect 22-inch 3-device terminated SCSI (199616-010) from duplex enabler board to the removable media bay devices. ■ See Note 2.

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SCSI Cable Usage Matrix for Duplex Mode *continued*

Controller	Hot-Plug SCSI Hard Drives in Internal Drive Cage	2/4 DAT Drive 4/8 DAT Drive Internal TurboDAT Autoloader 8X SCSI CD-ROM 4/16 TurboDAT 15/30 DLT Drive	35/70 DLT Drive
32 Bit Fast-Wide SCSI-2 Controller /P and Wide-Ultra Controller/P	■ Use cable option kit 306585-B21. ■ Connect 19-inch point-to-point non-terminated SCSI cable (199606-007) from optional controller board to SCSI Input 0 of duplex board. ■ Connect a second 19-inch point-to-point non-terminated SCSI cable (199606-007) from SCSI port 1 or 2 of integrated SCSI controller to Input 1 of duplex board. or ■ Use second 32 bit fast-wide controller and additional cable option kit.	■ Use cable option kit 306585-B21. ■ Connect 32-inch 3-device non-terminated SCSI cable (199616-012) from optional controller board to removable media bay devices. ■ Use 50 to 68 pin adapter (199618-001), if needed.	■ Use cable option kit 306585-B21. ■ Connect 32-inch 3-device non-terminated SCSI cable (199616-012) from optional controller board to removable media bay devices.

Continued

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SCSI Cable Usage Matrix for Duplex Mode *Continued*

Controller	Hot-Plug SCSI Hard Drives in Internal Drive Cage	2/4 DAT Drive 4/8 DAT Drive Internal TurboDAT Autoloader 8X SCSI CD-ROM 4/16 TurboDAT 15/30 DLT Drive	35/70 DLT Drive
Smart-2 Array Controller /SL, /P, /DH, and Smart Array 3200 Controller Without Loopback SCSI Option	■ Use cable option kit 306585-B21. ■ Connect 19-inch point-to-point non-terminated SCSI cable (199606-007) from optional controller board to SCSI Input 0 of duplex board or ■ Use second SMART or Smart Array 3200 Controller and additional cable option kit. ■ Connect a second 19-inch point-to-point non-terminated SCSI cable (199606-007) from SCSI port 1 or 2 of integrated SCSI controller to Input 1 ot duplex board.	Tape Drives and CD-ROMs are *not supported* using a SMART-2 Array Controller	Tape Drives and CD-ROMs are *not supported* using a SMART-2 Array Controller

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SCSI Cable Usage Matrix for Duplex Mode *Continued*

Controller	Hot-Plug SCSI Hard Drives in Internal Drive Cage	2/4 DAT Drive 4/8 DAT Drive Internal TurboDAT Autoloader 8X SCSI CD-ROM 4/16 TurboDAT 15/30 DLT Drive	35/70 DLT Drive
Smart-2 Array Controller, /P, /DH With Loopback SCSI Option	■ Use cable option kit 306585-B21. This kit includes the loop back SCSI cable kit and a SCSI slot bracket. ■ Connect 19-inch point-to-point non-terminated SCSI cable (199606-007) from the internal SCSI connector of the optional controller board to SCSI Input 0 of the duplex board. ■ Connect 8.75" external loopback SCSI cable from external SCSI connector of optional controller board to a SCSI slot bracket. Install this bracket in an unused slot. ■ Connect 20-inch cable shipped with the optional controller board from SCSI slot bracket to SCSI Input 1 of duplex board.	Tape Drives and CD-ROMs are *not supported* using a SMART-2 Array Controller	Tape Drives and CD-ROMs are *not supported* using a SMART-2 Array Controller

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SCSI Cable Usage Matrix for Duplex Mode *Continued*

Note 1: A third SCSI controller card is needed to connect to hard drive backplane SCSI inputs 0 or 1 to support duplex mode operation for this configuration.

Note 2: SCSI PORT 2 output will not operate at ultra SCSI speed if non-ultra drives are used in the removable media bay

Note 3: If additional external 50- to 68-pin adapters are needed, order option kit 212055-001.

Note 4: The loopback SCSI option is not supported by the SMART-2/SL controller.

Note 5: The SCSI Port 2 Controller is connected to the SCSI Port 2 connector and external SCSI connector. It is recommended that you use SCSI Port 2 controller for either internal or external drives, not both.

Examples

This section contains example cabling scenarios covering the most common applications. If your planned configuration does not match one of these examples, use the SCSI Cable Matrices in Tables 7-1 and 7-2 and these examples as a general guide.

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Example 1: Using Integrated SCSI Port 1 and Port 2 for Hard Drives with SCSI Input 1 Connected to the Removable Media Bay

1. Install the Duplex Enabler Board on the back of the Drive Cage, if not already installed.
2. Connect 19-inch point-to-point non-terminated SCSI cable (199606-007), from the SCSI Port 1 to SCSI Input 0 of the duplex board. Connect another 19-inch point-to-point non-terminated SCSI cable (199606-007) from SCSI Port 2 to SCSI Input 1 of the duplex board. These connections are shown in Figures 7-13 and 7-14.
3. Use 22-inch 3-device non-terminated SCSI cable (199616-010), supplied with server, to connect from the duplex enabler board to the removable media bay.

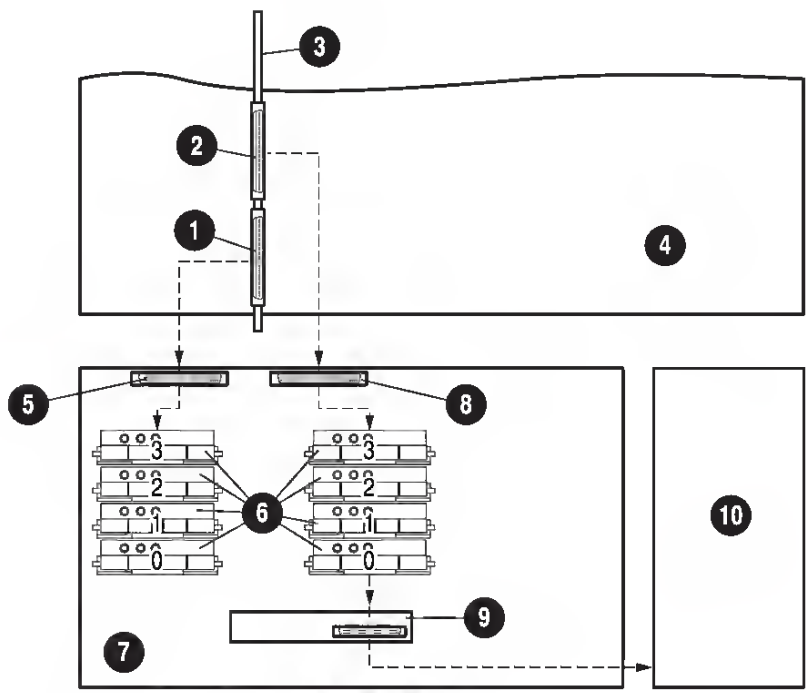

Figure 7-13. Example 1: Configuration diagram

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❶ SCSI Port 1

❷ SCSI Port 2

❸ Peripheral board

❹ System board

❺ SCSI Input 0

❻ SCSI hard drives

❼ Duplex board

❽ SCSI Input 1

❾ Duplex enabler board

❿ Removable media bay

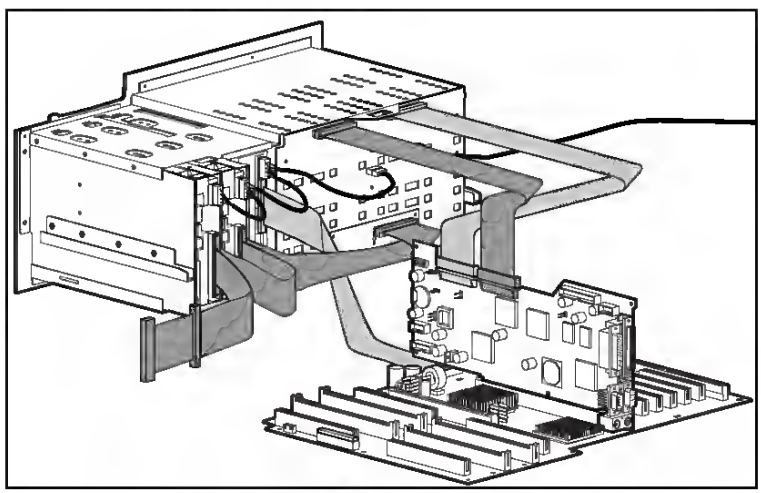

Figure 7-14. Example 1: Connection diagram

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Appendix A
Regulatory Compliance Notices

Federal Communications Commission Notice

Part 15 of the Federal Communications Commission (FCC) Rules and Regulations has established Radio Frequency (RF) emission limits to provide an interference-free radio frequency spectrum. Many electronic devices, including computers, generate RF energy incidental to their intended function and are, therefore, covered by these rules. These rules place computers and related peripheral devices into two classes, A and B, depending upon their intended installation. Class A devices are those that may reasonably be expected to be installed in a business or commercial environment. Class B devices are those that may reasonably be expected to be installed in a residential environment (i.e., personal computers). The FCC requires devices in both classes to bear a label indicating the interference potential of the device as well as additional operating instructions for the user.

The rating label on the device shows which class (A or B) the equipment falls into. Class B devices have an FCC logo or FCC ID on the label. Class A devices do not have an FCC logo or ID on the label. Once the class of the device is determined, refer to the following corresponding statement.

Class B Equipment

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

Declaration of Conformity for Products Marked with FCC Logo, United States Only

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. For questions regarding your product., contact:

Compaq Computer Corporation
P. O. Box 692000, Mail Stop 530113
Houston, Texas 77269-2000

Or call (800) 652-6672
For continuous quality improvement, calls may be monitored or recorded.

To identify this product, refer to the Series number found on the product.

For questions regarding this FCC declaration, contact:

Compaq Computer Corporation
P. O. Box 692000, Mail Stop 510101
Houston, Texas 77269-2000

Or call (281) 514-3333

To identify this product, refer to the parts, series, or model number found on the product.

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Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Compaq Computer Corporation may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

Canadian Notice (Avis Canadien)

Class B Equipment

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union Notice

Products with the CE Marking comply with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms (in brackets are the equivalent international standards):

- EN55022 (CISPR 22) - Electromagnetic Interference
- EN50082-1 (IEC801-2, IEC801-3, IEC801-4) - Electromagnetic Immunity
- EN60950 (IEC950) - Product Safety

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Japanese Notice

Class B Equipment

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

Laser Devices

The CD-ROM drive contains a laser device. All Compaq systems equipped with a laser device comply with safety standards, including International Electrotechnical Commission (IEC) 825. With specific regard to the laser, the equipment complies with laser product performance standards set by government agencies as a Class 1 laser product. The product does not emit hazardous light; the beam is totally enclosed during all modes of customer operation and maintenance.

Laser Safety Warnings

WARNING: To reduce the risk of fire, bodily injury, and damage to the equipment, observe the following precautions:

- Do not operate controls, make adjustments, or perform procedures to a laser device other than those specified herein or in the CD-ROM drive installation guide.
- Allow only Compaq Authorized Service Technicians to repair the laser equipment.

Compliance with CDRH Regulations

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured from August 1, 1976. Compliance is mandatory for products marketed in the United States.

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Compliance with International Regulations

All Compaq systems equipped with CD-ROM drives comply with appropriate safety standards including IEC 825.

Laser Product Label

The following label or equivalent is located on the surface of your CD-ROM drive.

This label indicates that the product is classified as a CLASS 1 LASER PRODUCT. This label appears on a laser device installed in your product.

Laser Information

Laser Type	Semiconductor GaAlAs
Wave Length	780 nm +/- 35 nm
Divergence Angle	53.5 degrees +/- 0.5 degrees
Output Power	Less than 0.2 mW /10,869 W·m-2 sr-1
Polarization	Circular 0.25
Numerical Aperture	0.45 inches +/- 0.04 inches

Battery Replacement Notice

Your computer is provided with a Real-Time Clock circuit powered by an internal Lithium Manganese Dioxide or Lithium Vanadium Pentoxide battery. There is a danger of explosion and risk of personal injury if the battery is incorrectly replaced or mistreated. Replacement is to be done by a Compaq Authorized Service Provider using the Compaq spare designated for this product. For more information about Real-Time Clock battery replacement or proper disposal, contact your Compaq Authorized Reseller or your Authorized Service Provider.

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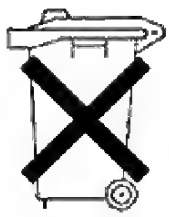
Batteries, battery packs, and accumulators should not be disposed of together with the general household waste. In order to forward them to recycling or proper disposal, please use the public collection system or return them to Compaq, your authorized Compaq Partners, or their agents.

WARNING: To reduce the risk of personal injury, do not attempt to recharge the battery, disassemble it, immerse it in water, or dispose of it in fire.



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Appendix B
Electrostatic Discharge

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding Methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ± 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

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If you do not have any of the suggested equipment for proper grounding, have an Authorized Compaq Reseller install the part.

NOTE: For more information on static electricity, or assistance with product installation, contact your Authorized Compaq Reseller.

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Appendix C
Power Cord Set Requirements

The power cord set meets the requirements for use in the country where you purchased your equipment. The voltage selection switch allows you to select the appropriate line voltage for your server.

Power cord sets for use in other countries must meet the requirements of the country where you use the server. For more information on power cord set requirements, contact your Authorized Compaq Dealer.

General Requirements

The requirements listed below are applicable to all countries:

- The length of the power cord must be at least 6.0 feet (1.8 m) and a maximum of 12 feet (3.7 m).
- The power cord set must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord will be used.
- The power cord set must have a minimum current capacity and nominal voltage rating of 10 A/125 volts AC, or 10A/250 volts AC, as required by each country's power system.
- The appliance coupler must meet the mechanical configuration of an EN60320/IEC 320 Standard Sheet C13 Connector, for mating with the appliance outlet on the computer.

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Country-Specific Requirements

Use the following table to identify the appropriate accredited agency in your country.

Table C-1
Power Cord Set Requirements - By Country

Country	Accredited Agency	Applicable Note Numbers
Australia	EANSW	1
Austria	OVE	1
Belgium	CEBC	1
Canada	CSA	2
China	CCEE	1
Denmark	DEMKO	1
Finland	SETI	1
France	UTE	1
Germany	VDE	1
Italy	IMO	1
Japan	JIS	3
Norway	NEMKO	1

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Power Cord Set Requirements - By Country *Continued*

Country	Accredited Agency	Applicable Note Numbers
Singapore	PSB or PUB	1
Sweden	SEMKO	1
Switzerland	SEV	1
United Kingdom	BSI	1
United States	UL	2

Notes:

1. Flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm^2 conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.

2. Flexible cord must be Type SVT or equivalent, No. 18 AWG, 3-conductor. Wall plug must be a two-pole grounding type with a NEMA 5-15P (15A, 125V).

3. Appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. Flexible cord must be Type VCT or VCTF, 3-conductor, 1.0 mm^2 conductor size. Wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7A, 125V) configuration.

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